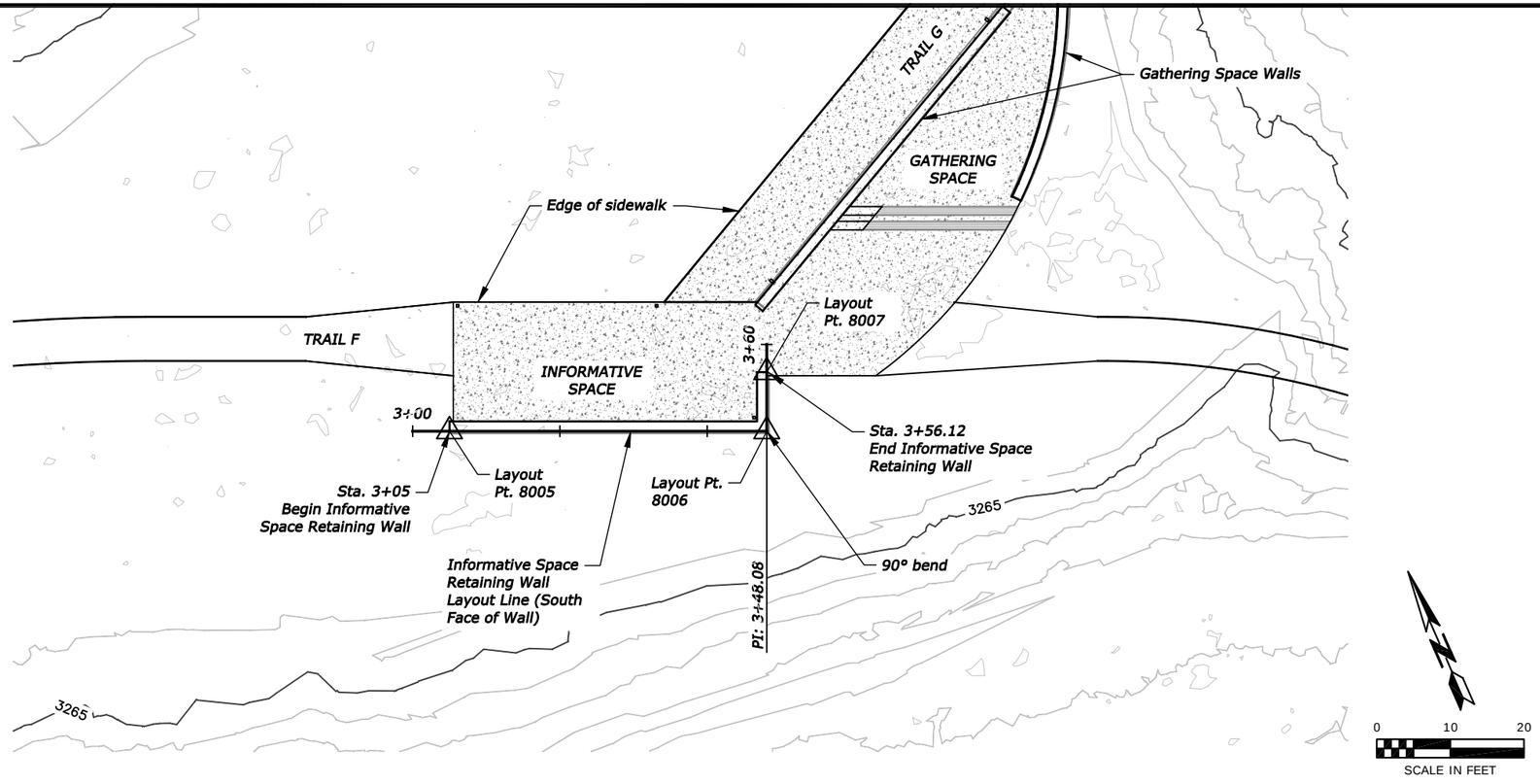
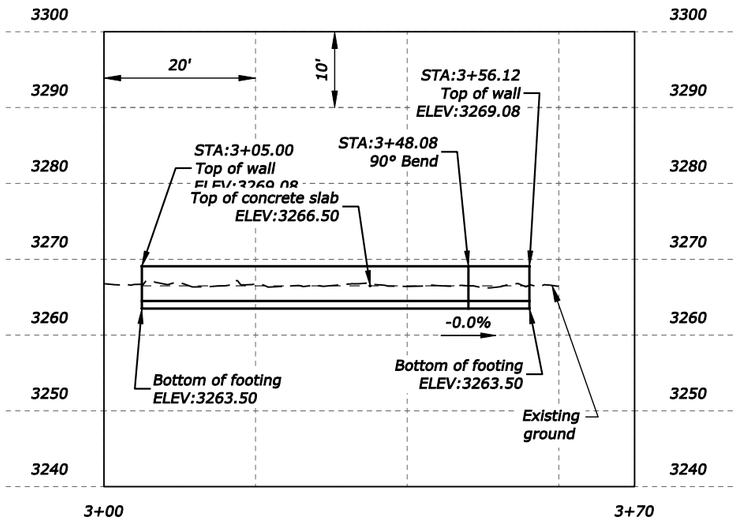
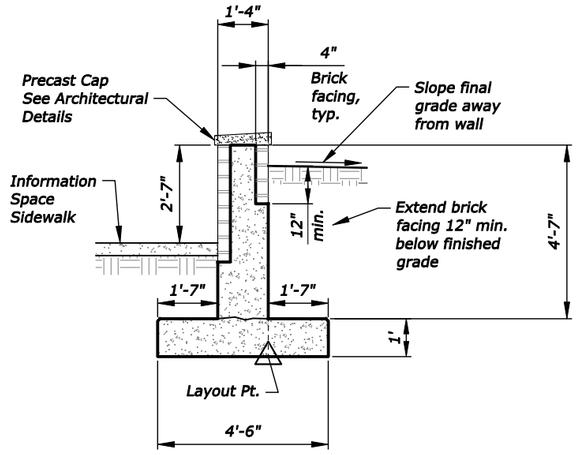


PLAN

LAYOUT POINT TABLE				
POINT #	*NORTHING*	*EASTING*	*ELEVATION*	*DESCRIPTION*
8005	17044025.24	917805.60	3263.50	STA 3+05
8006	17044007.90	917845.03	3263.50	STA 3+48.08
8007	17044015.26	917848.27	3263.50	STA 3+56.12



PROFILE



TYPICAL SECTION

Not to Scale

BY	DATE	REVISION DESCRIPTION

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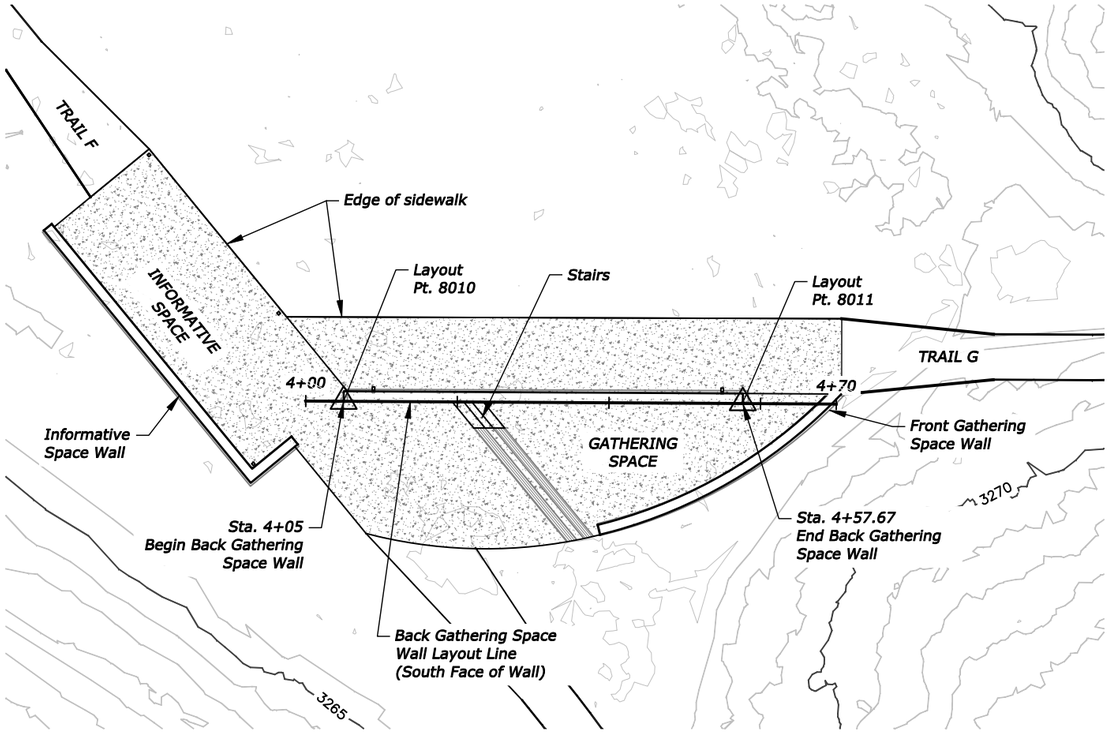
MONTANA STATE PARKS

MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

PAVILION RETAINING WALL
INFORMATIVE SPACE WALL

SHEET S1 OF S18

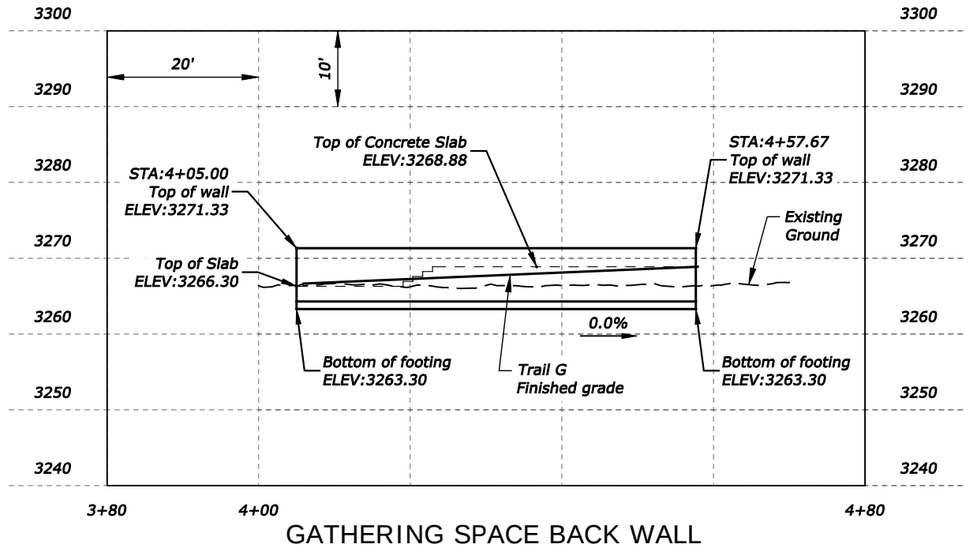


0 10 20

SCALE IN FEET

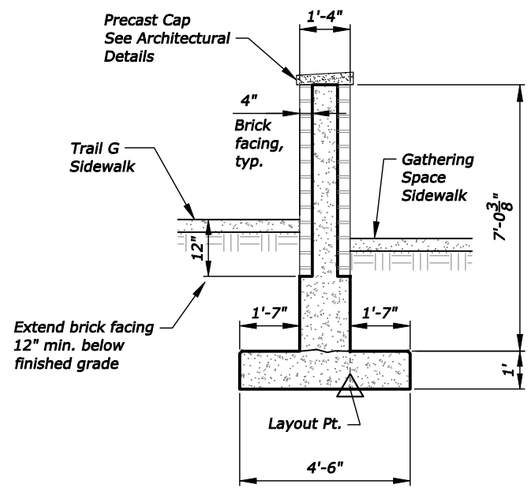
PLAN

LAYOUT POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
8010	17044023.05	917851.10	3263.30	STA 4+05
8011	17044046.65	917898.18	3263.30	STA 4+57.67



GATHERING SPACE BACK WALL

PROFILE



TYPICAL SECTION

Not to Scale

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MONTANA STATE PARKS

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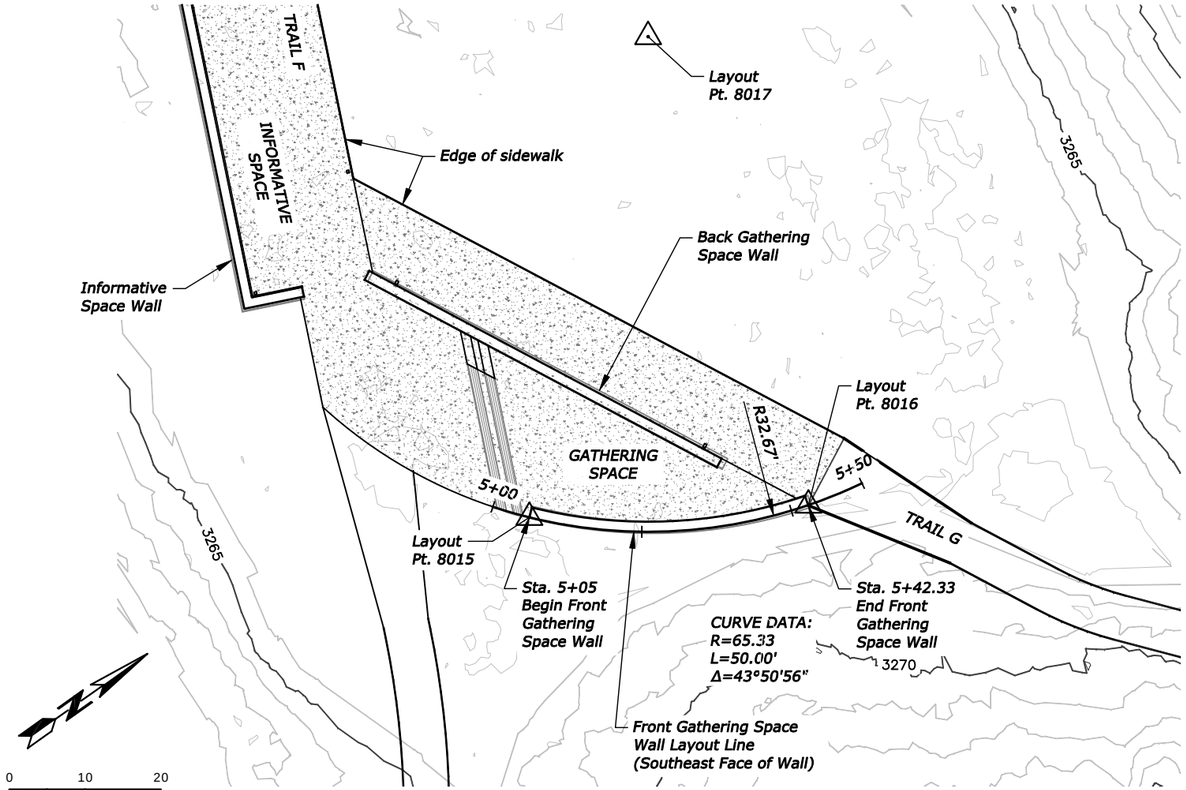
MILLTOWN STATE PARK

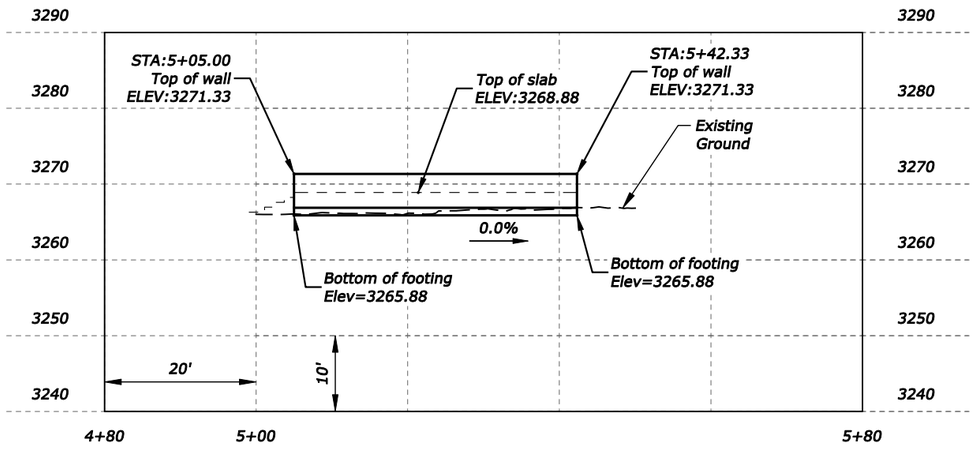
PAVILION RETAINING WALL
BACK GATHERING WALL

SHEET S2 OF S18

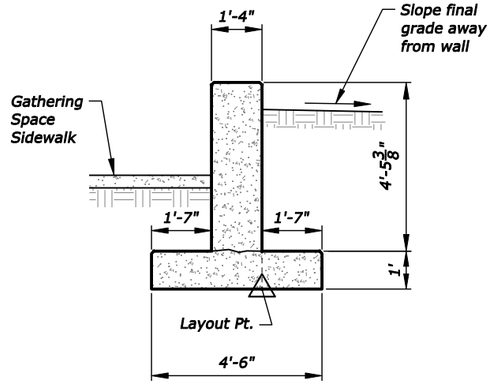


PLAN

LAYOUT POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
8015	17044022.66	917889.22	3265.88	STA 5+05
8016	17044053.59	917909.20	3265.88	STA 5+42.33
8017	17044072.14	917846.56	0.00	CENTER PT



GATHERING SPACE FRONT WALL PROFILE



TYPICAL SECTION

Not to Scale

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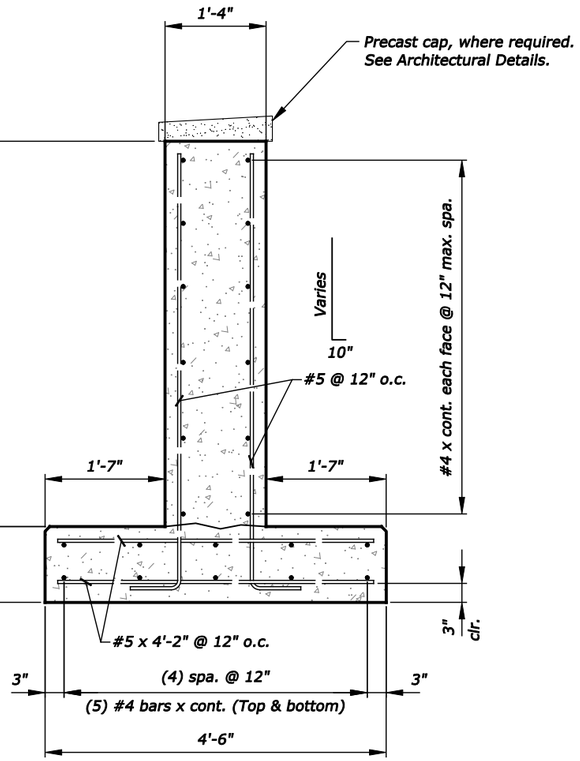
MILLTOWN STATE PARK

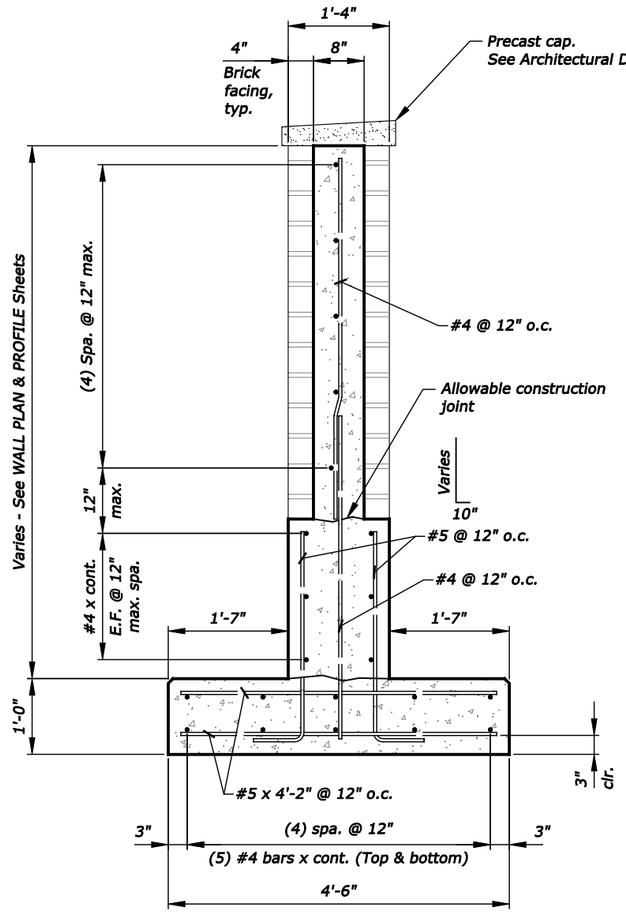
PAVILION RETAINING WALL
FRONT GATHERING WALL

SHEET S3 OF S18



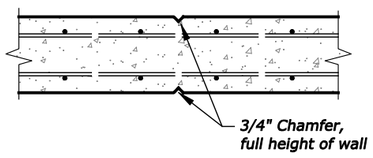
PLAIN-FACED WALL DETAILS

Scale: 1/2" = 1'-0"



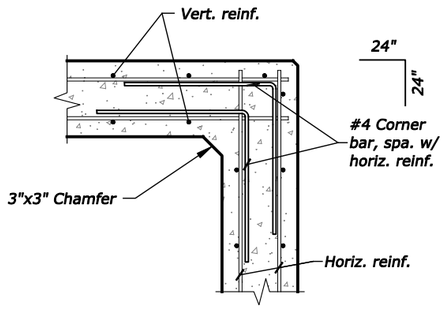
BRICK-FACED WALL DETAILS

Scale: 1/2" = 1'-0"



WEAKENED PLANE

Provide weakened plane every 20'± along length of wall.



90° CORNER

MISCELLANEOUS DETAILS

Scale: 1/2" = 1'-0"

NOTES

1. *Use Concrete with F'c = 4000 psi (compressive strength) at 28 days and an entrained air content of 5% ± 1%. Chamfer all exposed edges of concrete 3/4". Finish by removing all fins and other irregular projection, cleaning and pointing all form tie cavities, holes or other defects. Remove localized poorly bonded rock pockets or honeycombed concrete and replace with sound concrete or dry packed mortar. Provide a uniform rubbed finish of consistent color and texture on all exposed surfaces.*
2. *Use reinforcing steel of the deformed type conforming to AASHTO M31 (ASTM A615), Grade 60. Provide 2" concrete cover over rebar except where shown. Cut and bend steel in accordance with ACI 315.*
3. *Lap splice #4 bars 1'-8" min., stagger splices.*
4. *Include the cost of reinforcing steel in the item for Reinforced Concrete Wall.*

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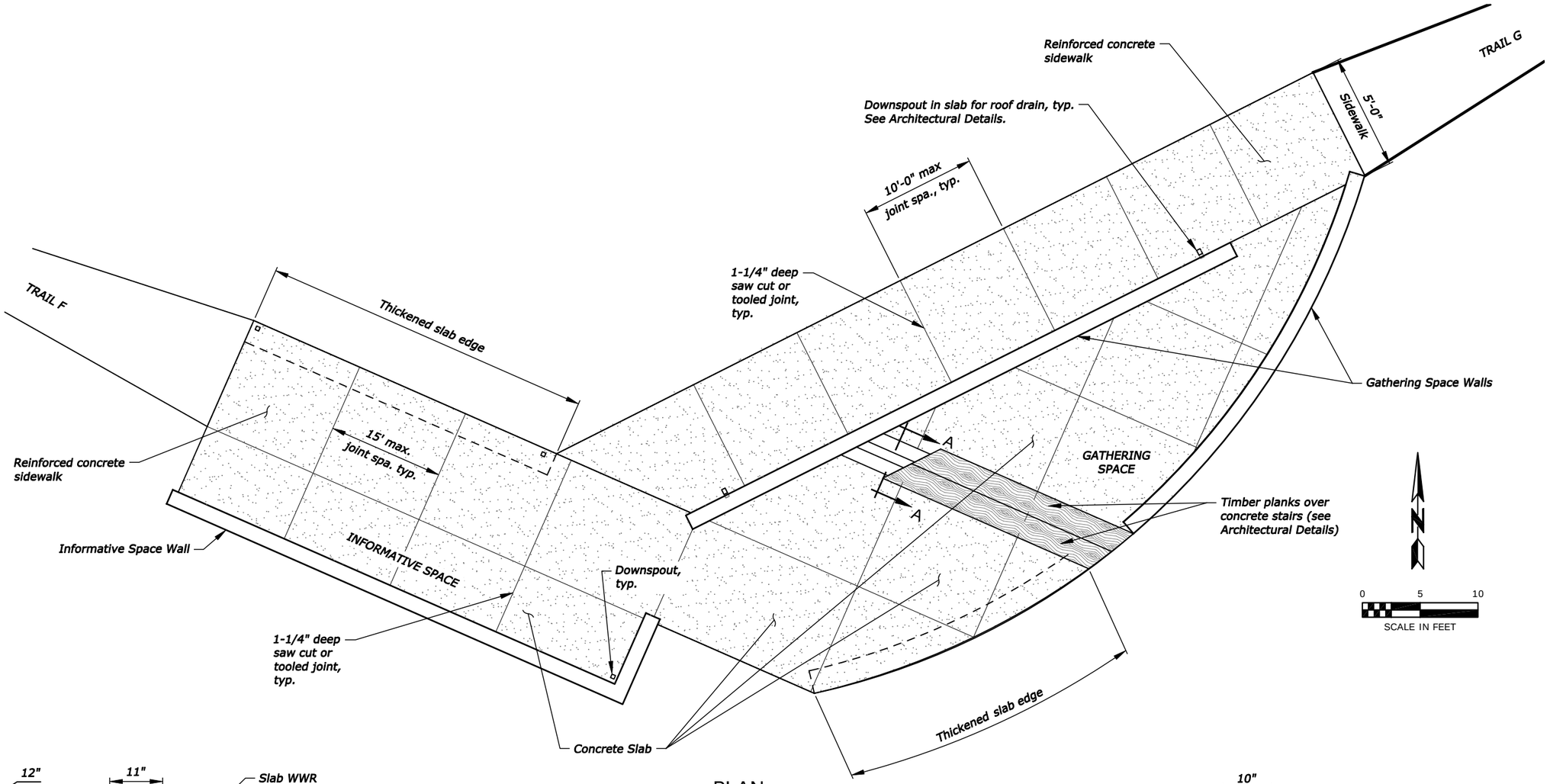
MONTANA STATE PARKS

MT FISH, WILDLIFE & PARKS

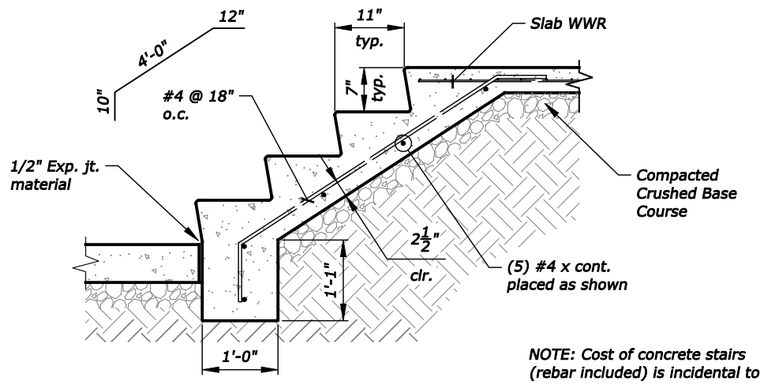
MILLTOWN STATE PARK

PAVILION RETAINING WALL
WALL DETAILS

SHEET S4 OF S18



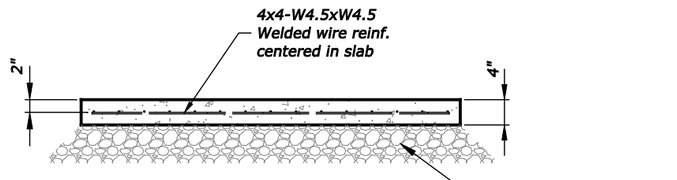
PLAN



SECTION A-A

Not to Scale

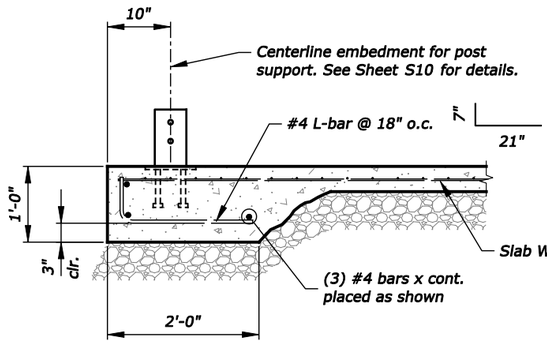
NOTE: Cost of concrete stairs (rebar included) is incidental to the item for concrete sidewalk.



SLAB TYPICAL SECTION

Not to Scale

NOTE: Cost of WW reinf. is included in the item for concrete. Estimated quantity of rebar is 0.92 lb/sf.



SLAB THICKENED EDGE

Not to Scale

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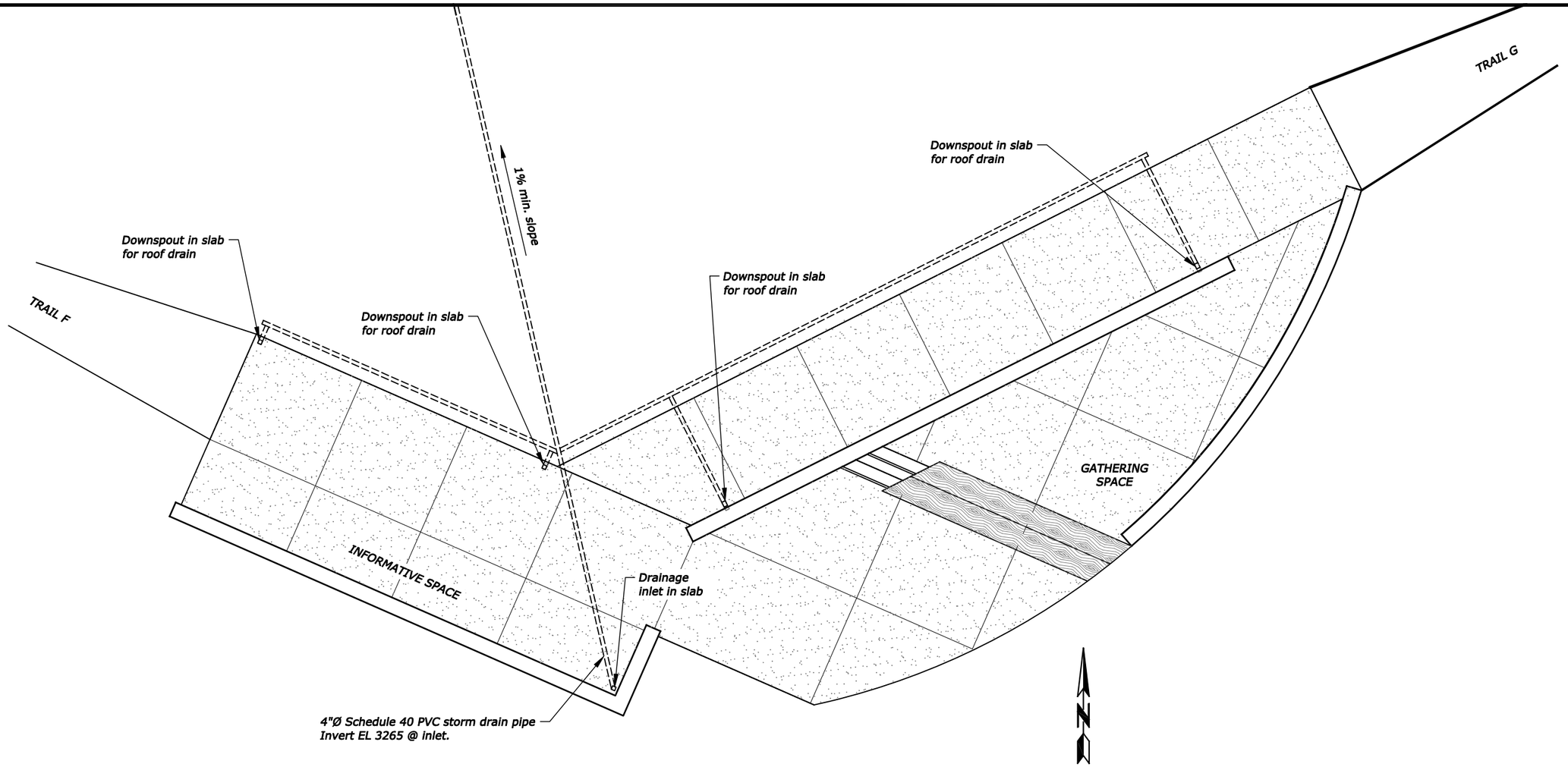
MONTANA STATE PARKS
REAL MONTANA. REAL CLOSE.

MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

PAVILION
FOUNDATION PLAN

SHEET S5 OF S18



PLAN

NOTES

1. *Use Piedmont Boot roof downspout adapter or approved equal for roof drain to downspout in slab connection.*
2. *Use Neenah R-4937-B Floor Drain Grate or approved equal for drainage inlet in slab.*
3. *Use Schedule 40 PVC for all storm drain pipe and fittings.*

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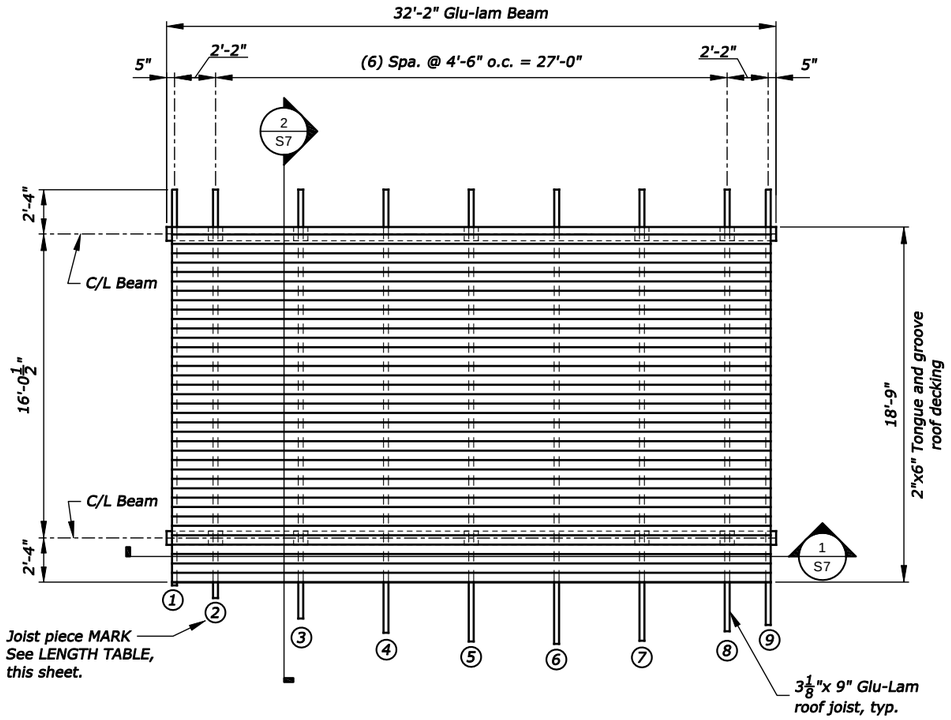
REAL MONTANA. REAL CLOSE.

MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

PAVILION
DRAINAGE PLAN

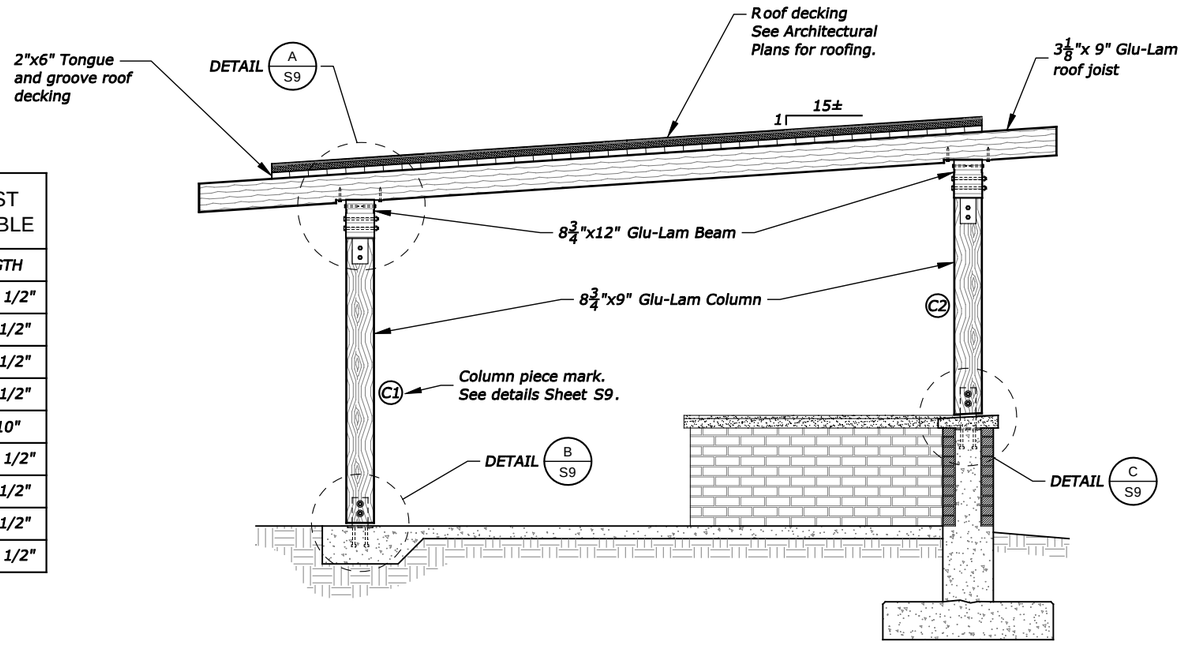
SHEET S6 OF S18



FRAMING PLAN INFORMATIVE SPACE

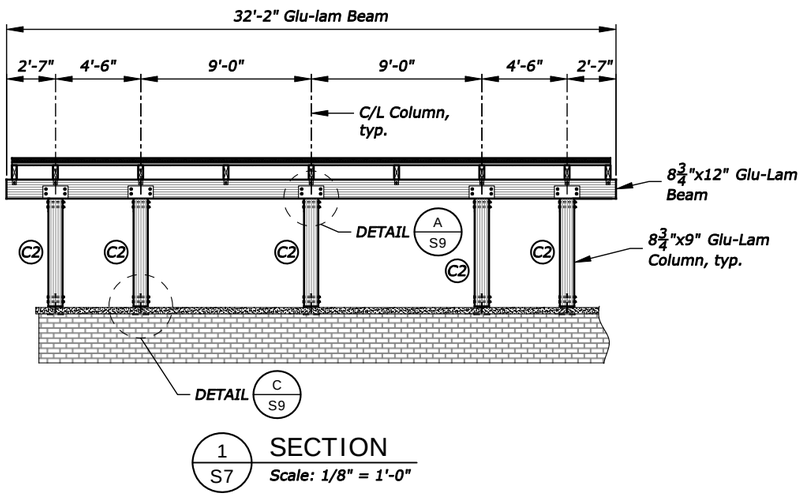
Scale: 1/8" = 1'-0"

ROOF JOIST LENGTH TABLE	
MARK	*LENGTH*
1	*20'-10 1/2"*
2	*21'-6 1/2"*
3	*22'-7 1/2"*
4	*23'-4 1/2"*
5	*23'-10"*
6	*23'-11 1/2"*
7	*23'-9 1/2"*
8	*23'-3 1/2"*
9	*22'-11 1/2"*



2 S7 SECTION

Scale: 1/4" = 1'-0"



1 S7 SECTION

Scale: 1/8" = 1'-0"

COLUMN LENGTH TABLE	
MARK	*LENGTH*
C1	*7'-6"*
C2	*5'-8 1/2"*

NOTES

1. *Use structural glued laminated members of Coast Region Douglas Fir conforming to American Institute of Timber Construction (AITC) 117-2004 for the combination symbol specified below. Fabricate for industrial appearance using resorcinol glues.*

MEMBER	*COMBINATION SYMBOL*
Columns	*3, 4 or 5*
Beams & Joists	*24F-V8*

2. *Furnish No. 2 Grade or better tongue & groove decking members.*
3. *After fabrication, incise and pressure treat all timber members in conformance with AWPA U1, Use Category UC3B (above ground, exposed) using Ammoniacal Copper Quat (ACQ) treatment. Follow WWPI's "Best Management Practices for the Use of Treated Wood in Aquatic Environments."*
4. *Shop drill holes for connections in timber beams and columns prior to treatment.*
5. *Use bolts, nuts and washers conforming to ASTM A307. Paint flat black.*
6. *Use steel shapes, plates & bars meeting the requirements of ASTM A36. Paint exposed timber connection plates with a 3 mil dry thickness zinc-rich epoxy primer and a top coat (flat black) of 3 mil dry thickness TGIC polyester powder coat. Prior to painting, prepare surface by blast cleaning to near white metal according to SSPC-SP 10.*

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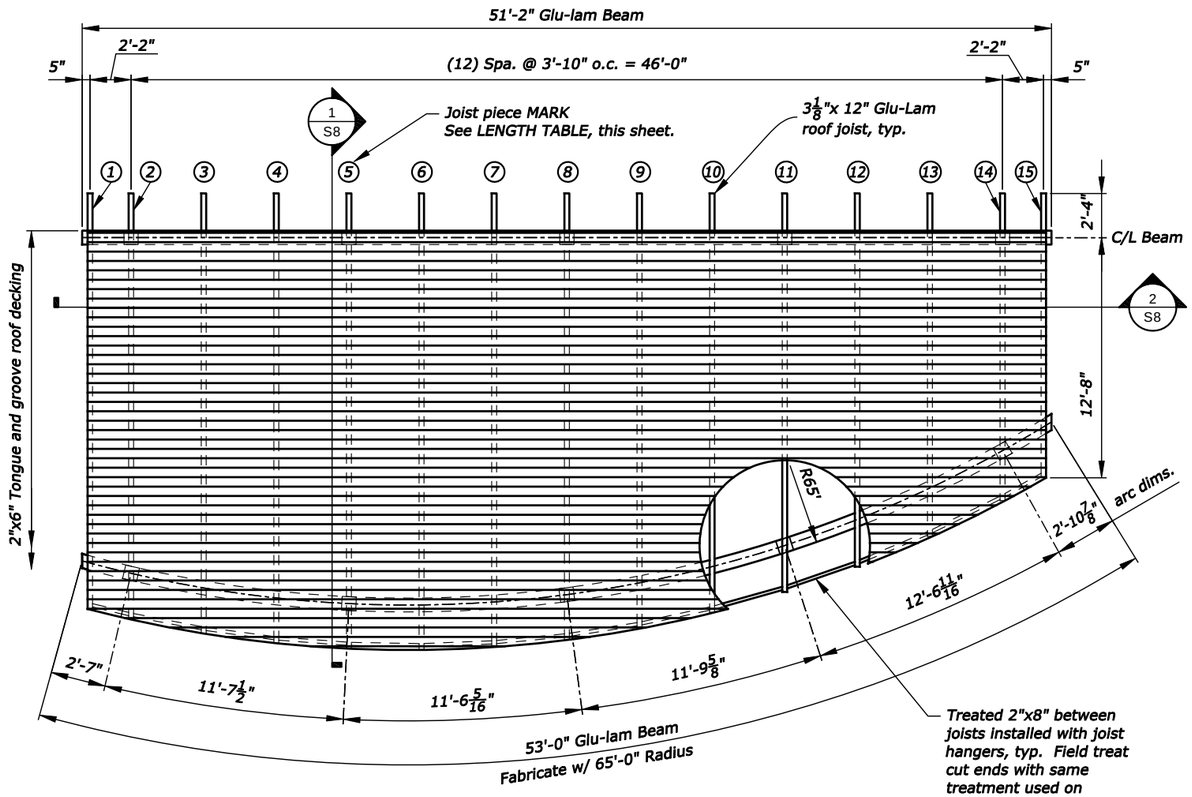
MONTANA STATE PARKS

MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

INFORMATIVE SPACE
FRAMING PLAN & DETAILS

SHEET S7 OF S18

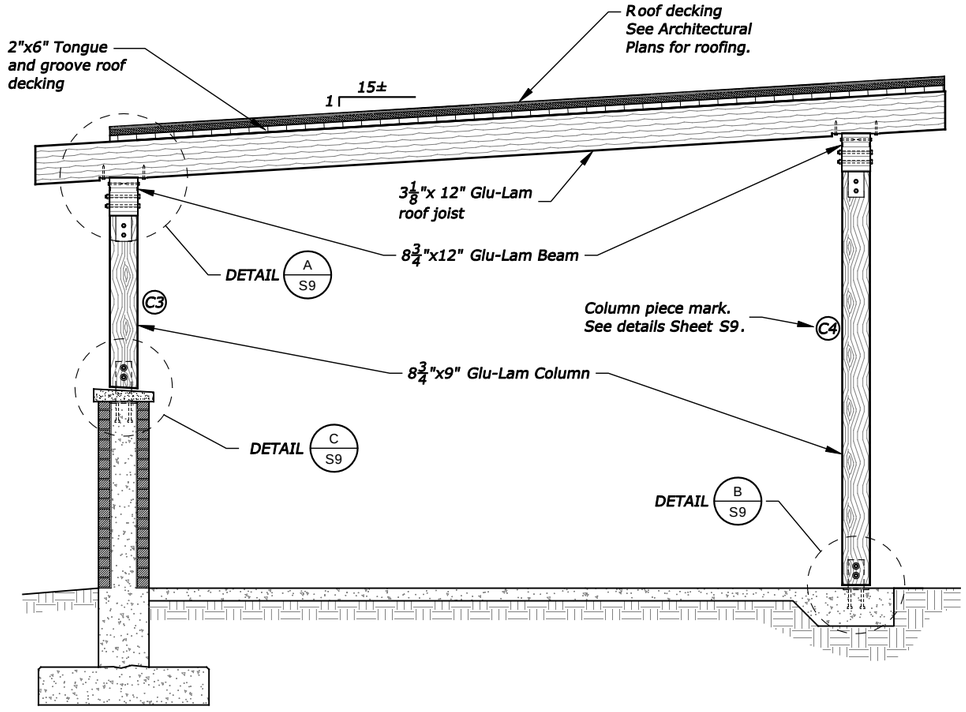


FRAMING PLAN GATHERING SPACE

Scale: 1/8" = 1'-0"

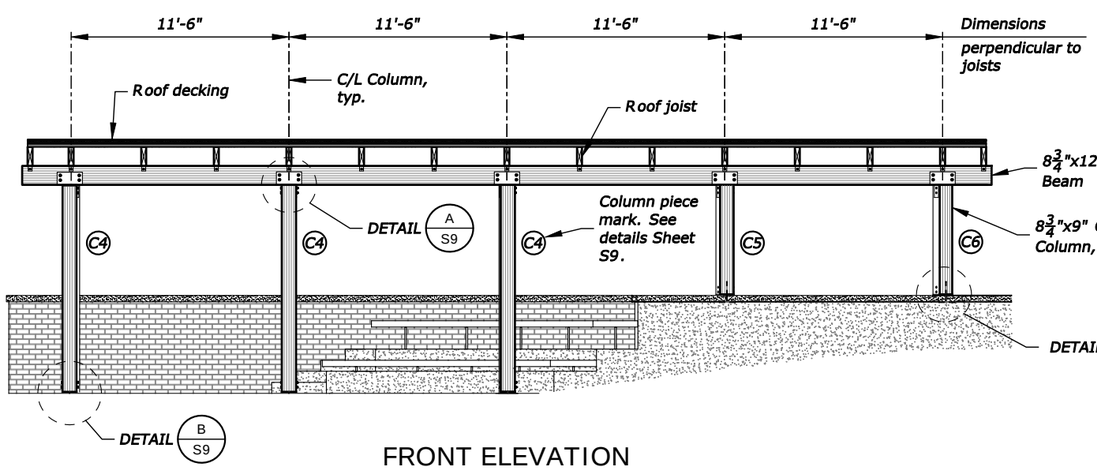
ROOF JOIST LENGTH TABLE	
MARK	LENGTH
1	21'-11"
2	22'-5 1/2"
3	23'-2 1/2"
4	23'-8 1/2"
5	24'-0"
6	24'-1"
7	23'-11"
8	23'-6 1/2"
9	22'-11 1/2"
10	22'-1 1/2"
11	21'-0 1/2"
12	19'-8 1/2"
13	18'-1"
14	16'-2 1/2"
15	14'-11 1/2"

COLUMN LENGTH TABLE	
MARK	LENGTH
C3	4'-6 1/2"
C4	10'-11"
C5	5'-6"
C6	5'-2 1/2"



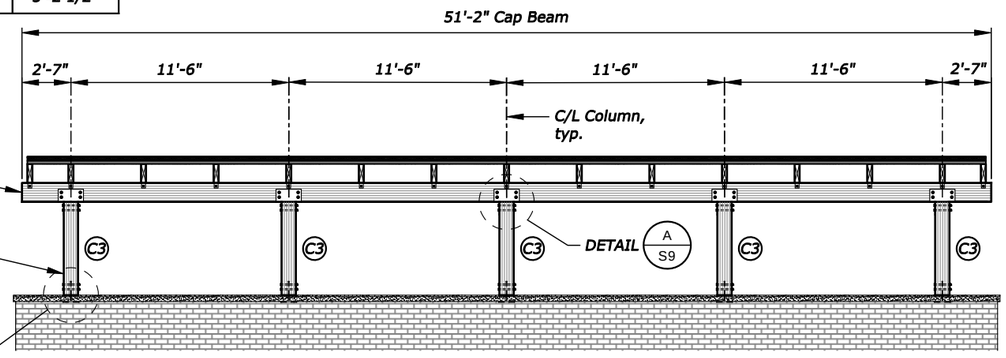
1 S8 SECTION

Scale: 1/4" = 1'-0"



FRONT ELEVATION

Scale: 1/8" = 1'-0"



2 S8 SECTION

Scale: 1/8" = 1'-0"

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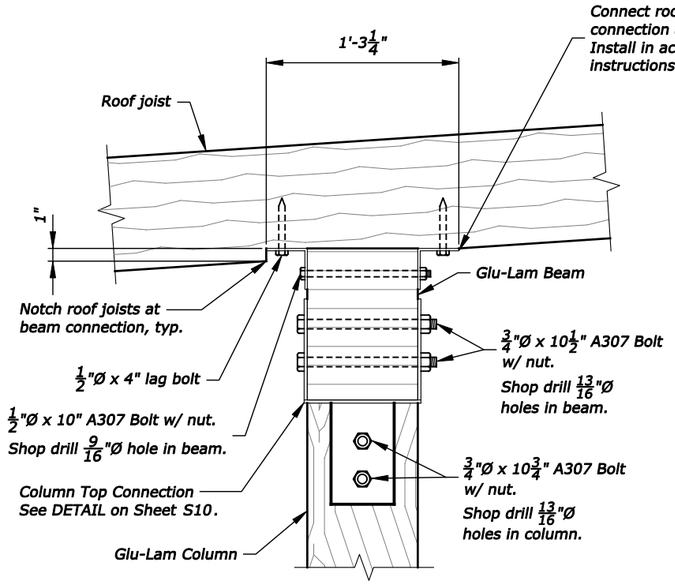
MT FISH, WILDLIFE & PARKS

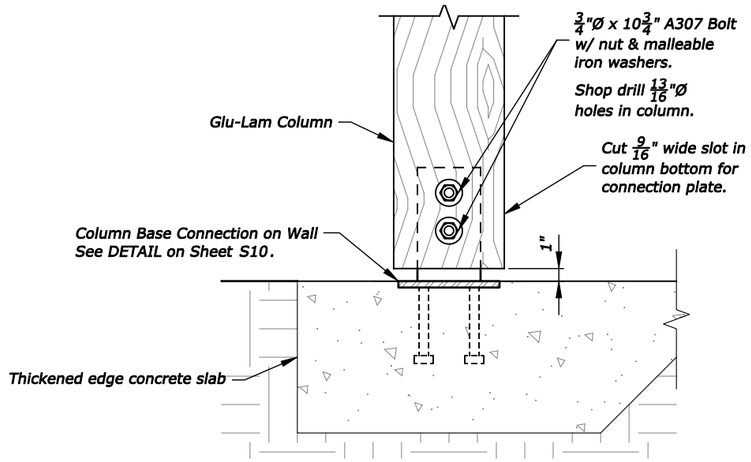
MILLTOWN STATE PARK

GATHERING SPACE
FRAMING PLAN & DETAILS

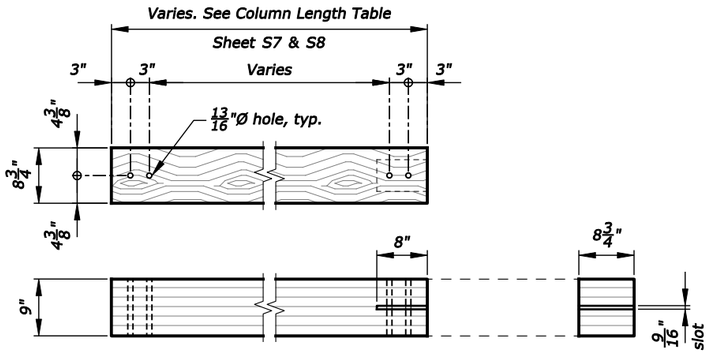
SHEET S8 OF S18



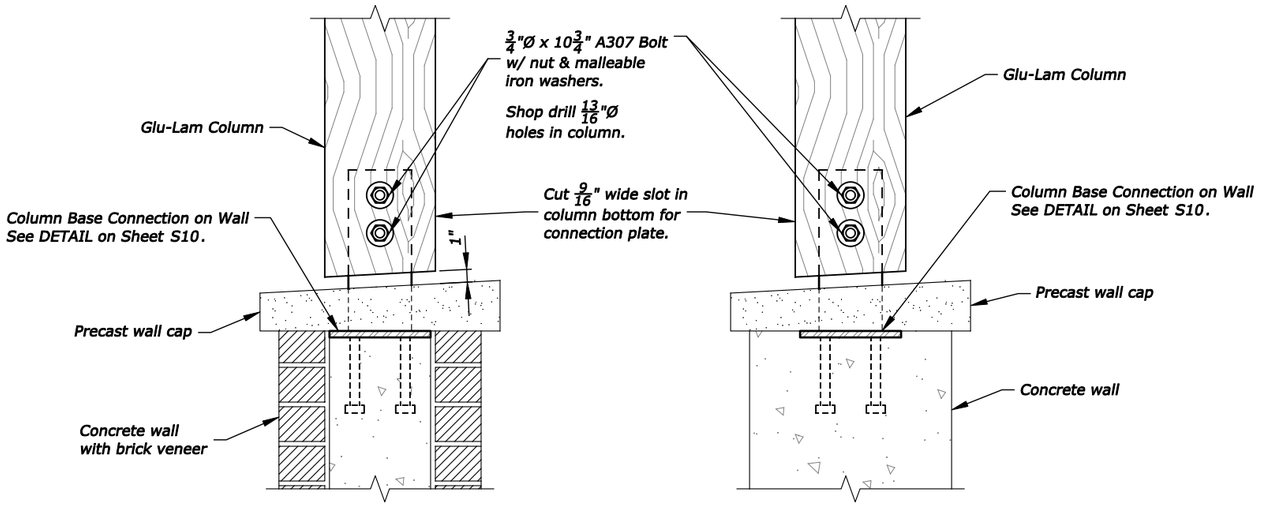
A S9 DETAIL *COLUMN TOP*
Scale: 1" = 1'-0"



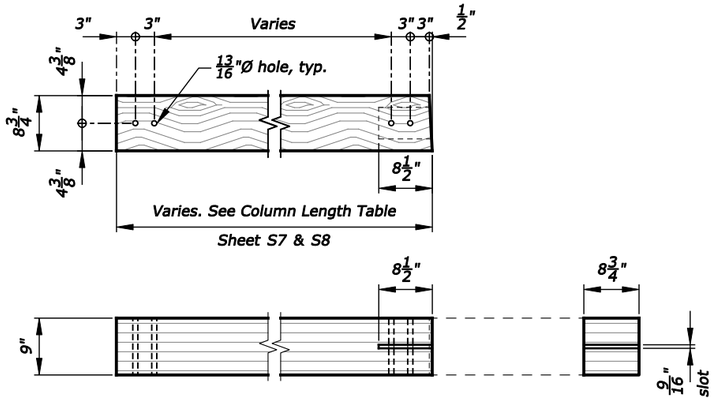
B S9 DETAIL *COLUMN BASE - SLAB*
Scale: 1" = 1'-0"



D S9 DETAIL *COLUMN MARK C1 & C4*
Scale: 1/2" = 1'-0"



C S9 DETAIL *COLUMN BASE - WALL*
Scale: 1" = 1'-0"



E S9 DETAIL *COLUMN MARK C2, C3, C5 & C6*
Scale: 1/2" = 1'-0"

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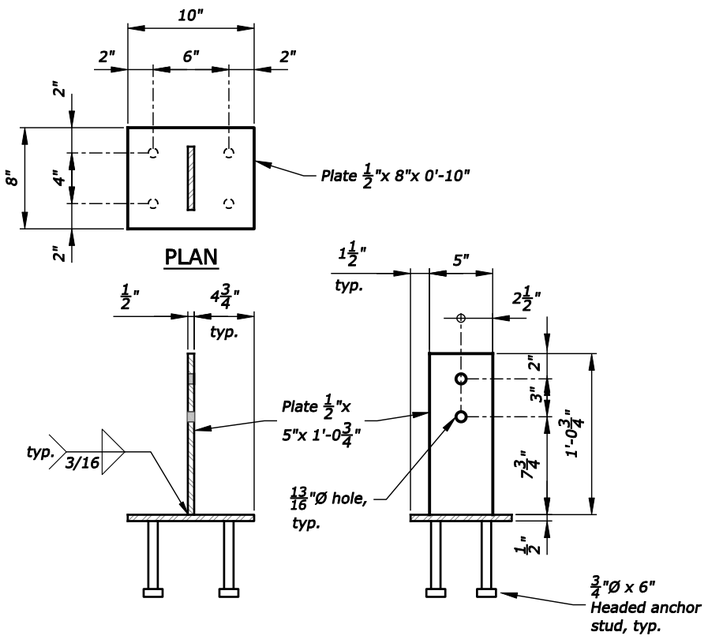
MILLTOWN STATE PARK

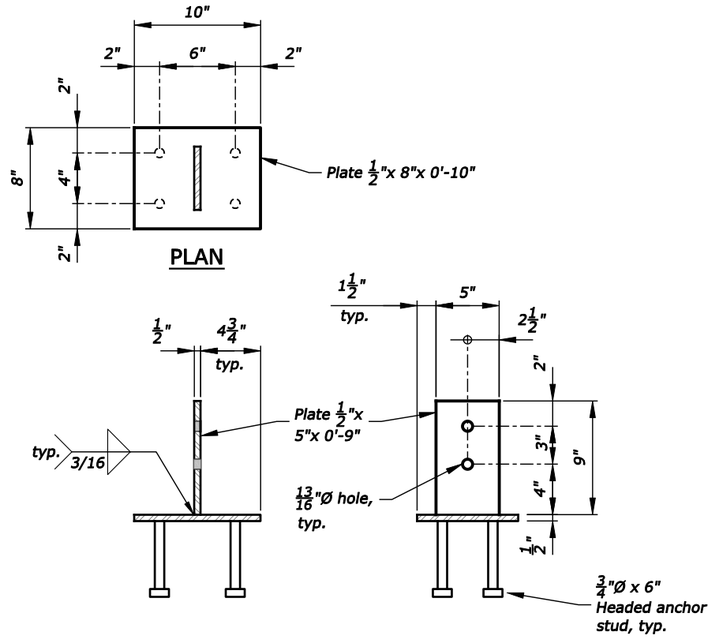
INFORMATIVE & GATHERING SPACE
TIMBER DETAILS

SHEET S9 OF S18



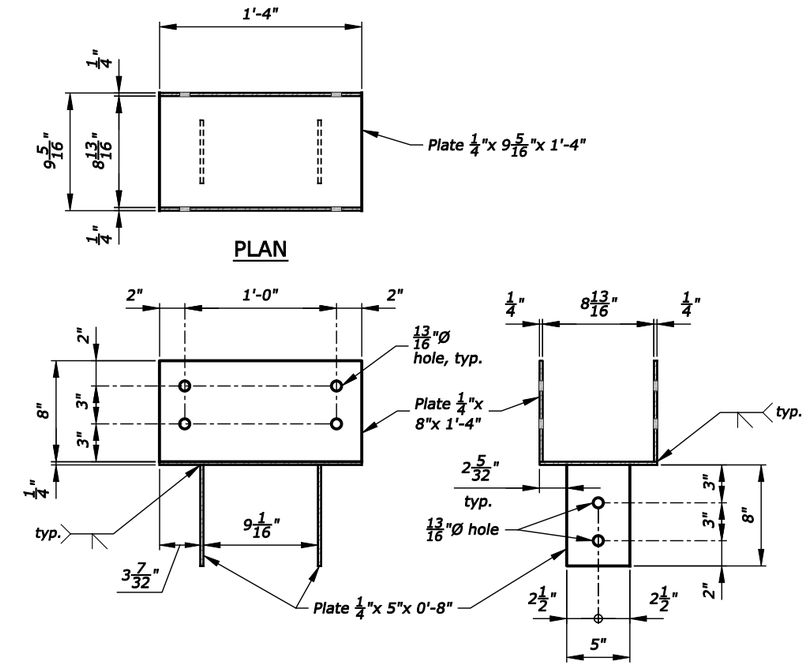
A S10 DETAIL *COLUMN BASE ON WALL CONNECTION*

Scale: 1" = 1'-0"



B S10 DETAIL *COLUMN BASE ON SLAB CONNECTION*

Scale: 1" = 1'-0"



C S10 DETAIL *COLUMN TOP CONNECTION*

Scale: 1" = 1'-0"

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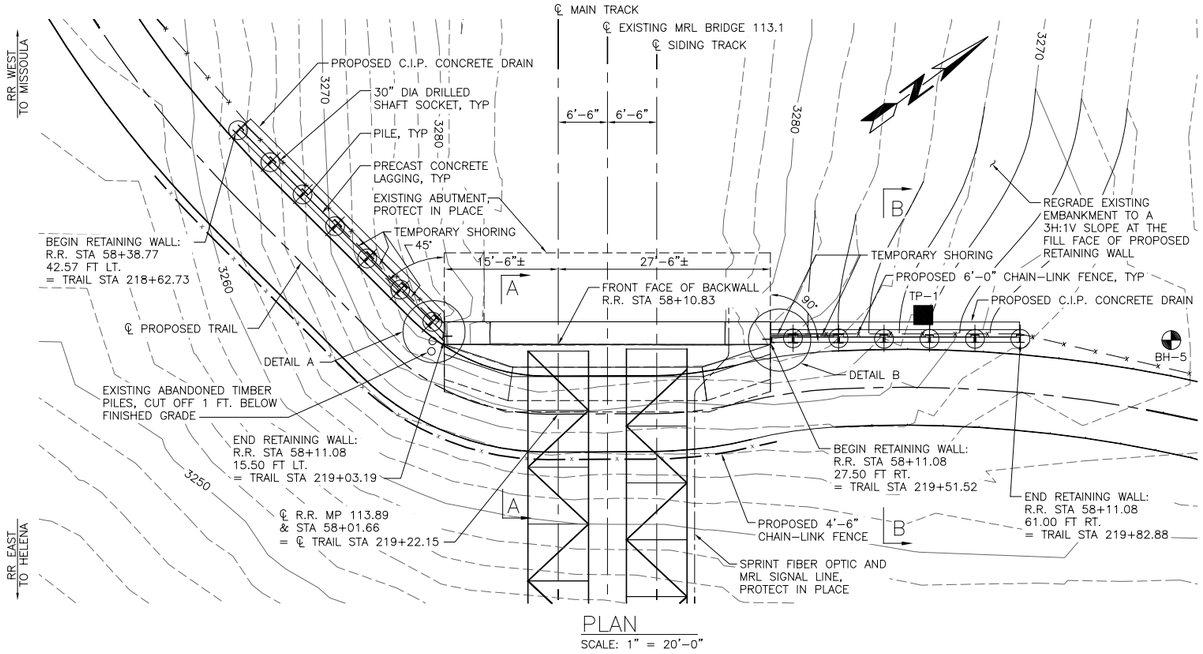
MILLTOWN STATE PARK

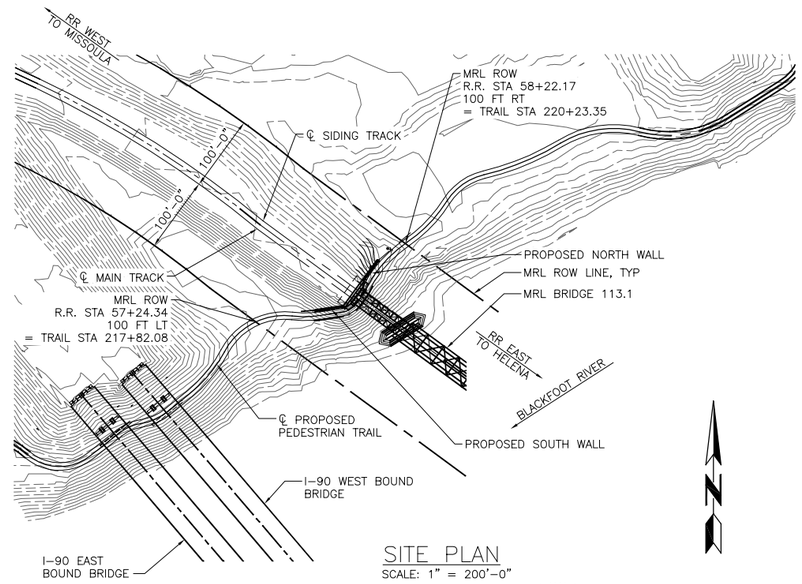
INFORMATIVE & GATHERING SPACE
STEEL DETAILS

SHEET S10 OF S18



PLAN

SCALE: 1" = 20'-0"



SITE PLAN

SCALE: 1" = 200'-0"

GENERAL NOTES

RETAINING WALL DESIGNED IN ACCORDANCE WITH THE 2015 A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING, CHAPTERS 8 AND 15.

EXISTING BRIDGE ELEVATIONS AND PROPOSED WALL ELEVATIONS ARE BASED ON SURVEY BY DJ&A DATED AUGUST, 2011.

NEW CONSTRUCTION SHOWN IN HEAVY LINES AND EXISTING STRUCTURE TO REMAIN IN PLACE SHOWN IN LIGHT SOLID LINES.

FOR GEOTECHNICAL INFORMATION, REFER TO GEOTECHNICAL REPORT PREPARED BY TETRATECH DATED MARCH 1, 2012.

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS AND GRADES PRIOR TO ORDERING MATERIAL AND PERFORMING WORK.

CONTRACTOR TO USE CAUTION DURING WALL AND TRAIL CONSTRUCTION TO LIMIT DISTURBANCE TO EXISTING RIPRAP BANK PROTECTION. CONTRACTOR NEEDS TO PREVENT RIPRAP FROM ROLLING DOWN BANK AND IMPACTING PIER OR HITTING RECREATIONAL USERS DURING TRAIL EXCAVATION AND GRADING.

THE CENTERLINE OF MAIN TRACK IS BASIS FOR R.R. STATIONING AND RIGHT-OF-WAY LIMITS.

PREVENT SLOUGHING OR FAILURE OF THE EXISTING RAILROAD EMBANKMENT DURING CONSTRUCTION OF THE SOLDIER PILE WALL. PROVIDE TEMPORARY SHORING AS NEEDED AND WITHIN THE MINIMUM EXTENTS SHOWN DURING CONSTRUCTION OF THE SOLDIER PILE WALL. PROVIDE DESIGN CALCULATIONS AND DRAWINGS STAMPED BY A MT PE FOR APPROVAL OF THE TEMPORARY SHORING. DESIGN AND CONSTRUCT TEMPORARY SHORING IN ACCORDANCE WITH RAILROAD GUIDELINES FOR TEMPORARY SHORING. PAYMENT FOR TEMPORARY SHORING IS NOT MADE SEPARATELY AND CONSIDERED INCIDENTAL TO THE WORK.

REFER TO THE PROJECT SPECIFICATIONS AND SPECIAL PROVISIONS FOR OTHER REQUIREMENTS FOR WORKING ON RAILROAD PROPERTY.

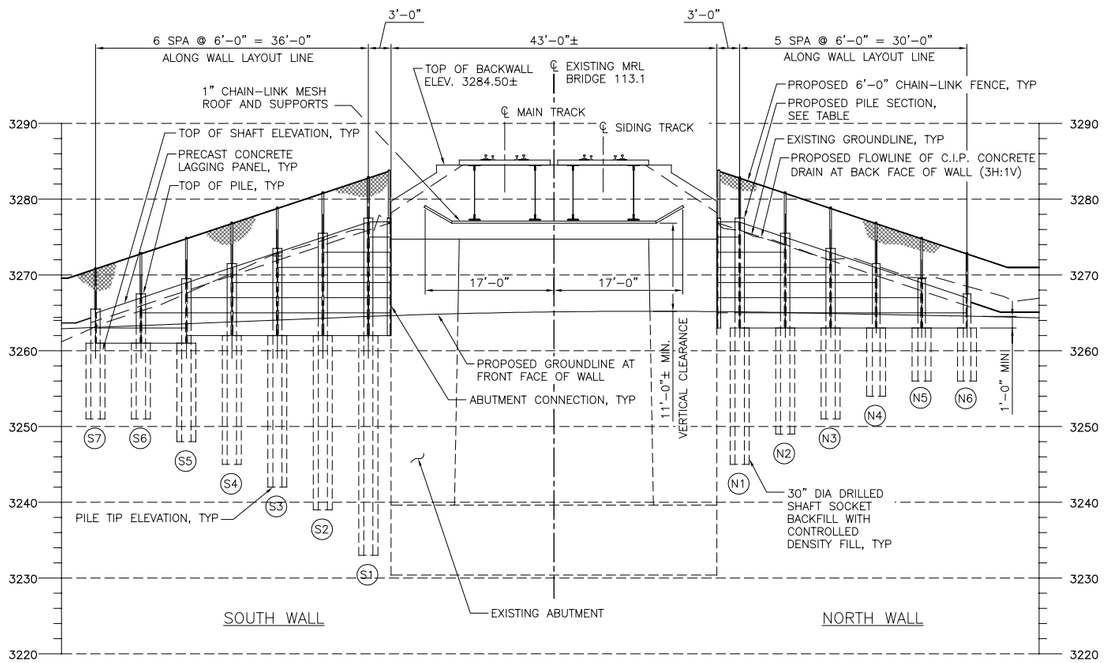
REFERENCES

PLANS FOR THE EXISTING MRL BRIDGE 113.1 ARE AVAILABLE FROM DEPARTMENT OF FISH, WILDLIFE AND PARKS.

SEE SHEET S12 FOR SECTION A-A AND SECTION B-B

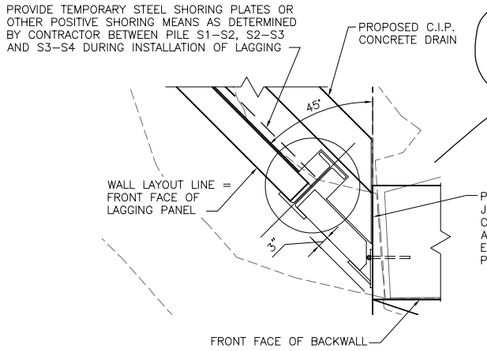
NOTE

VERIFY THE LOCATION, RELOCATION, ABANDONMENT, AND/OR TEMPORARY SUPPORT OF ALL UTILITIES AFFECTED BY THE CONSTRUCTION. THE CONTRACTOR SHALL INFORM UTILITY COMPANIES, AGENCIES, AND/OR AUTHORITIES OF ALL PLANNED WORK IN THE AREA CONTAINING UTILITIES. THE CONTRACTOR SHALL NOTIFY ONE-CALL LOCATORS 48 HOURS PRIOR TO PLANNED WORK (DIAL 811). FIBER OPTIC, COMMUNICATIONS, CONTROL SYSTEMS, AND OTHER TYPES OF CABLES MAY BE BURIED ON RAILROAD PROPERTY. CONTACT LEON SCOLES MRL, 406-241-6674.



ELEVATION

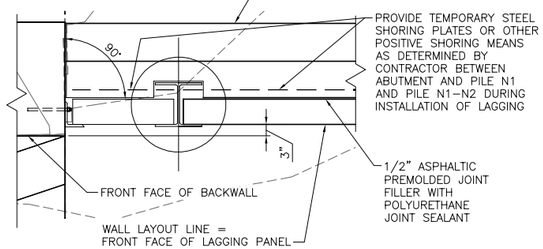
SCALE: 1" = 20'-0"



DETAIL A - SOUTH WALL @ ABUTMENT

NO SCALE

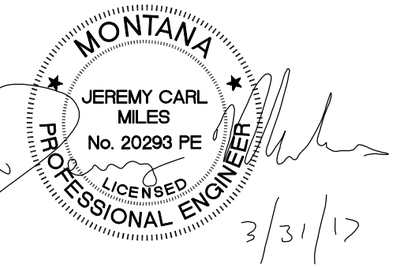
(SEE ADDITIONAL DETAILS ON SHEET S12)



DETAIL B - NORTH WALL @ ABUTMENT

NO SCALE

(SEE ADDITIONAL DETAILS ON SHEET S12)



PILE TABLE

PILE NUMBER	TOP OF PILE ELEVATION (FT)	TOP OF SHAFT ELEVATION (FT)	PILE TIP ELEVATION (FT)	ESTIMATED SHAFT LENGTH (FT)	ESTIMATED PILE LENGTH (FT)	PROPOSED PILE SECTION
S1	3277.50	3262.00	3233.00	29.00	44.50	W18x143
S2	3275.50	3262.00	3239.00	23.00	36.50	W18x143
S3	3273.50	3262.00	3242.00	20.00	31.50	HP14x89
S4	3271.50	3262.00	3245.00	17.00	26.50	HP14x89
S5	3269.50	3261.00	3248.00	13.00	21.50	HP12x53
S6	3267.50	3261.00	3251.00	10.00	16.50	HP12x53
S7	3265.50	3261.00	3251.00	10.00	14.50	HP12x53
N1	3277.50	3263.00	3245.00	18.00	32.50	HP14x89
N2	3275.50	3263.00	3249.00	14.00	26.50	HP14x89
N3	3273.50	3263.00	3251.00	12.00	22.50	HP12x53
N4	3271.50	3263.00	3254.00	9.00	17.50	HP12x53
N5	3269.50	3263.00	3256.00	7.00	13.50	HP12x53
N6	3267.50	3263.00	3256.00	7.00	11.50	HP12x53

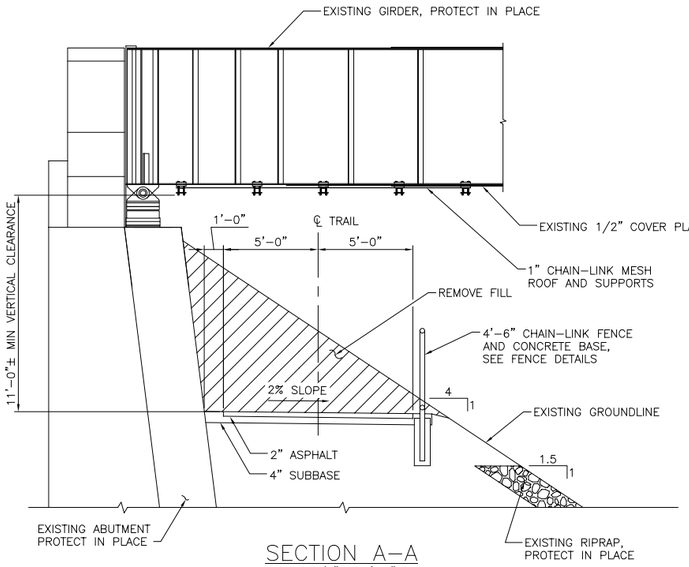
BY	DATE	REVISION DESCRIPTION

DESIGN JCM PROJ. NO. 5943
DRAWN AEG DATE 8/2016
CHECKED DLM SURVEYED DJ&A

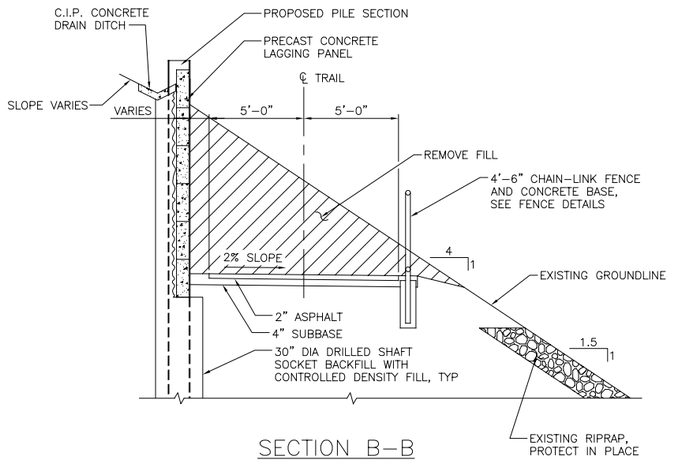
MILLTOWN STATE PARK
DEPARTMENT OF FISH, WILDLIFE AND PARKS
TRAILS AND PARK FACILITIES DEVELOPMENT

MRL BRIDGE 113.1 RETAINING WALLS
PLAN AND ELEVATION

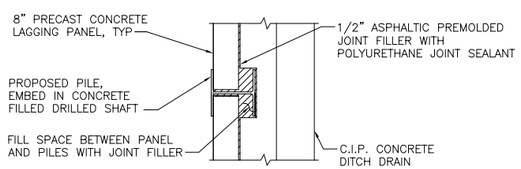
SHEET S11 OF S18



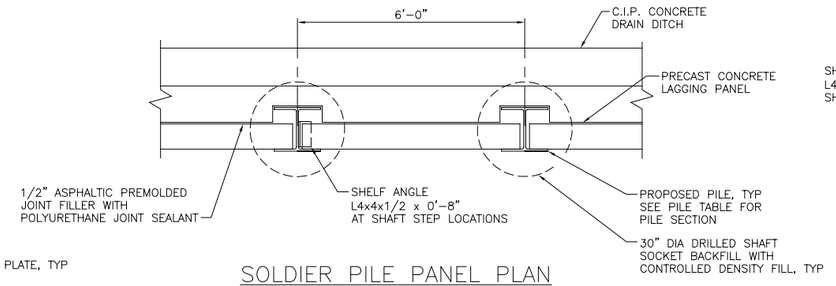
SECTION A–A
SCALE: 1/8" = 1'–0"



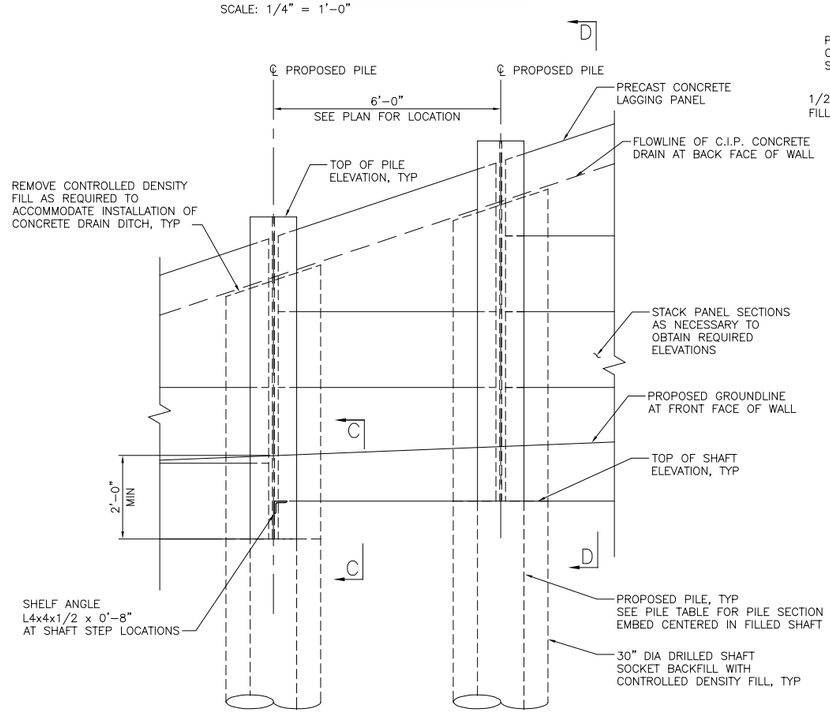
SECTION B–B
SCALE: 1/8" = 1'–0"



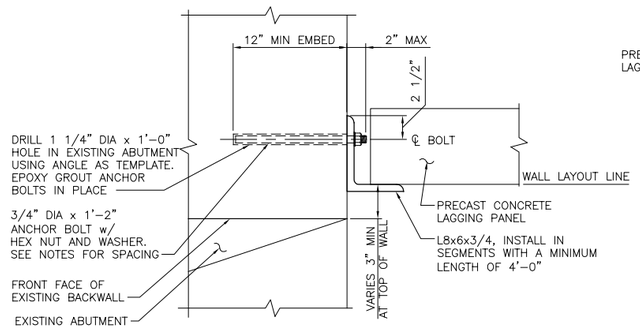
TYPICAL DETAIL @ PILE
SCALE: 1/4" = 1'–0"



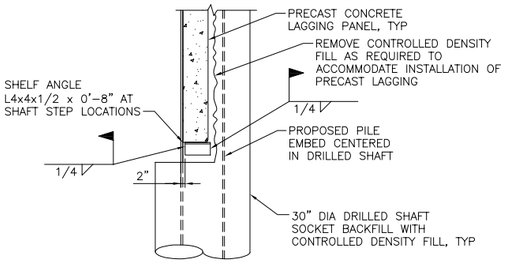
SOLDIER PILE PANEL PLAN
SCALE: 1/4" = 1'–0"



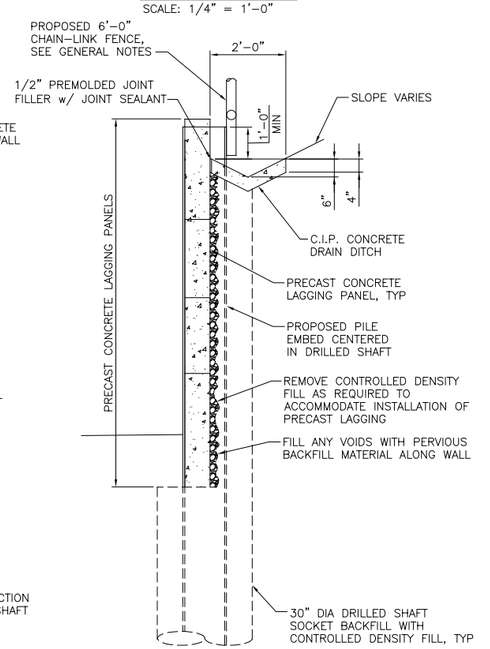
SOLDIER PILE PANEL ELEVATION
SCALE: 1/4" = 1'–0"

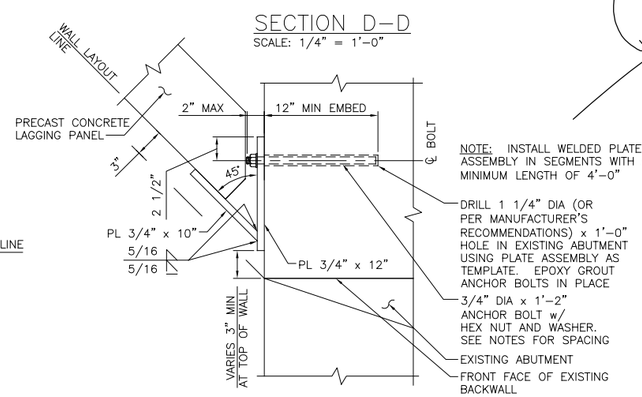


NORTH WALL ABUTMENT CONNECTION
SCALE: 3/4" = 1'–0"
(C.I.P. CONCRETE DRAIN NOT SHOWN FOR CLARITY)



SECTION C–C
SCALE: 1/4" = 1'–0"





SOUTH WALL ABUTMENT CONNECTION
SCALE: 3/4" = 1'–0"
(C.I.P. CONCRETE DRAIN NOT SHOWN FOR CLARITY)

STEEL NOTES

STRUCTURAL STEEL PILING SHALL CONFORM TO A.S.T.M. A572, GRADE 50.

ALL OTHER MISCELLANEOUS STRUCTURAL STEEL SHALL CONFORM TO A.S.T.M. A572, GRADE 50.

DEBURR ALL EDGES ON EXPOSED STEEL SURFACES.

WELDING SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT A.W.S. WELDING CODE. WELDING SHALL BE PERFORMED BY PERSONNEL QUALIFIED PER CURRENT A.W.S. CODE D1.1.

PAINT ALL EXPOSED PILES AND MISCELLANEOUS STRUCTURAL STEEL WITH ONE PRIME AND ONE FINISH COAT OF BRIDGE PAINT MEETING THE REQUIREMENTS OF THE SPECIFICATIONS. PAINT TO EXTEND AT LEAST ONE FOOT BELOW FINISHED GROUND. CARE SHALL BE TAKEN TO AVOID PAINTING PRECAST CONCRETE PANELS.

GENERAL NOTES

ANCHOR BOLTS SHALL BE GALVANIZED AND CONFORM TO A.S.T.M F1554 GRADE 36. MAXIMUM BOLT SPACING SHALL BE 1'–6". LOCATE BOLTS A MAXIMUM OF 6" FROM END OF ANGLE OR PLATE ASSEMBLY SECTIONS.

DRILL HOLES AND INSTALL EPOXY GROUT AND ANCHOR BOLTS PER MANUFACTURER'S SPECIFICATIONS.

ATTACH CHAINLINK FENCE POST TO BACK FACE OF STEEL SOLDIER PILE PER MANUFACTURER'S RECOMMENDATION. SUBMIT CONNECTION DETAILS TO ENGINEER FOR APPROVAL.

CONCRETE DRAIN SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.

CONSTRUCTION NOTES

PILE SHALL BE INSTALLED CAREFULLY SO THAT IT IS PLUMB AND ALIGNED SO THAT THE PRECAST CONCRETE PANELS CAN BEAR EVENLY AGAINST THE FLANGES OF THE PILES.

CONTROLLED DENSITY FILL SHALL MEET THE REQUIREMENTS FOR EXCAVATABLE CONTROLLED LOW STRENGTH MATERIAL FILL PER THE PROJECT SPECIFICATIONS. CONTROLLED DENSITY FILL SHALL BE INSTALLED TO THE TOP OF THE HOLE AND THE PORTION ABOVE THE FINISHED GROUNDLINE IN FRONT OF THE WALL SHALL BE EXCAVATED AND REMOVED DURING PLACEMENT OF THE PRECAST LAGGING PANELS.

PLACE TEMPORARY SHORING AS NEEDED TO MAINTAIN EXISTING RAILROAD EMBANKMENT.

CLEAN AND APPLY TOUCH–UP PAINT TO EXPOSED FACES OF PILES AFTER INSTALLATION OF PRECAST LAGGING PANELS.

BY	DATE	REVISION DESCRIPTION

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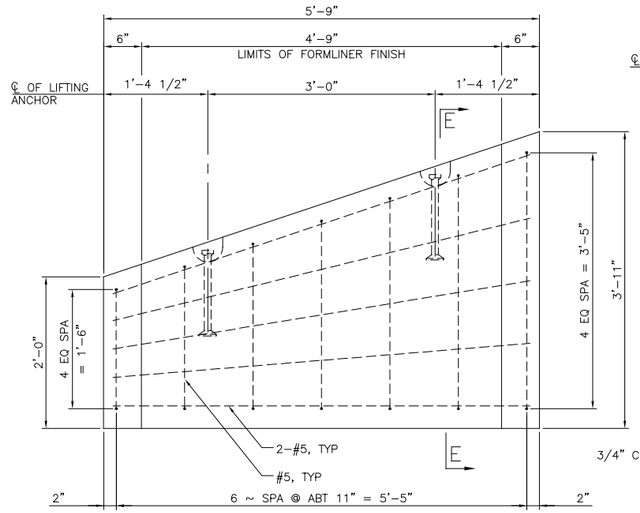
DRAWN AEG DATE 8/2016
CHECKED DLM SURVEYED DJ&A

MILLTOWN STATE PARK
DEPARTMENT OF FISH, WILDLIFE AND PARKS
TRAILS AND PARK FACILITIES DEVELOPMENT

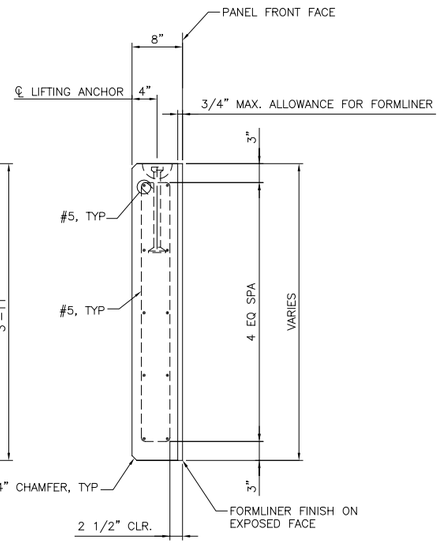
MRL BRIDGE 113.1 RETAINING WALLS
TYPICAL SECTIONS AND RETAINING WALL DETAILS

SHEET S12 OF S18



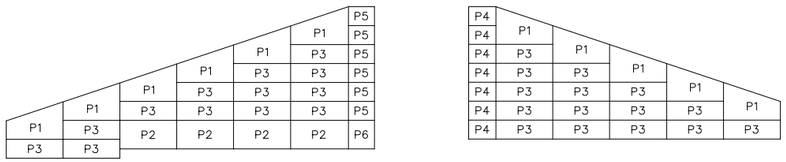
PRECAST CONCRETE LAGGING PANEL P1

SCALE: 1/2" = 1'-0"



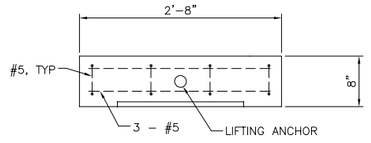
SECTION E-E

SCALE: 1/2" = 1'-0"

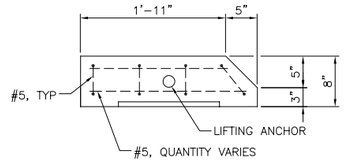


PANEL LAYOUT SCHEMATIC

NO SCALE



PANEL P4



PANEL P5 AND P6

RECAST CONCRETE LAGGING PANEL NOTES

PRECAST CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI AT 28 DAYS.

CONCRETE SHALL BE VIBRATED INTERNALLY DURING PLACEMENT TO PROVIDE THOROUGH CONSOLIDATION AND COMPACTION. CARE SHALL BE TAKEN TO AVOID DISPLACEMENT OF EMBEDDED ITEMS.

ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE SHOWN OR NOTED. DO NOT CHAMFER TOP AND BOTTOM EDGES OF PANELS ON FRONT FACE OF PANELS IN THOSE AREAS WHERE FORMLINER FINISH WILL BE APPLIED.

FORMLINER FINISH AND PRECAST LAGGING COLOR SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A615, GRADE 60.

ALL REINFORCING STEEL SHALL HAVE A MINIMUM OF 1 1/2" CLEAR COVER UNLESS OTHERWISE SHOWN OR NOTED. SPACE REBAR AS NEEDED TO AVOID EMBEDDED ITEMS.

ALL BAR BENDING AND STANDARD HOOK DIMENSIONS SHALL BE IN ACCORDANCE WITH "MANUAL OF STANDARD PRACTICE" AS PUBLISHED BY THE CONCRETE REINFORCING STEEL INSTITUTE UNLESS OTHERWISE SHOWN OR NOTED.

PROVIDE EMBEDDED LIFTING ANCHOR(S) IN TOP SURFACE OF PRECAST PANEL WITH A SAFE WORKING LOAD CAPABLE OF SUPPORTING THE SELFWEIGHT OF THE PANEL. INSERTS SHALL HAVE A 4 TO 1 SAFETY FACTOR UNLESS NOTED OTHERWISE. THE INSERTS SHALL BE COMPLETELY RECESSED. FILL INSERTS WITH GROUT AFTER PLACING PANELS.

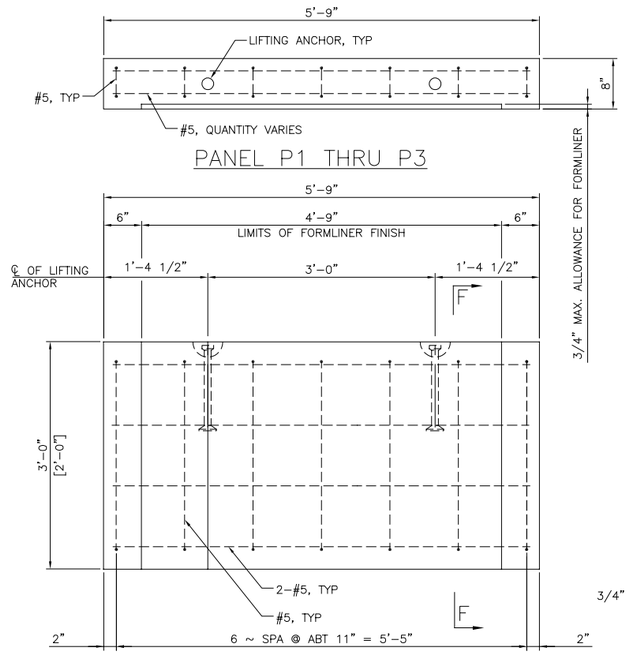
THE FABRICATOR SHALL STENCIL THE FABRICATOR'S NAME, DATE OF FABRICATION, PANEL DESIGNATION AND LIFTING WEIGHT ON THE PANEL BACK FACE.

PRECAST CONCRETE LAGGING PANEL QUANTITIES

PANEL	QUANTITY PER WALL	
	NORTH	SOUTH
P1	5	6
P2	0	4
P3	15	13
P4	7	0
P5	0	6
P6	0	1

ESTIMATED LIFTING WEIGHT PER PANEL

PANEL	WEIGHT (LBS)
P1	1,700
P2	1,725
P3	1,150
P4	540
P5	440
P6	660



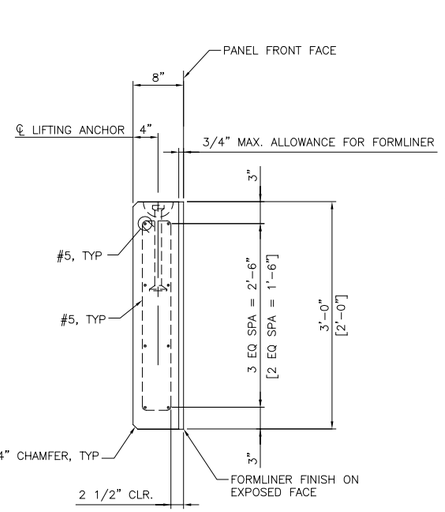
PRECAST CONCRETE LAGGING PANEL P2 AND P3

SCALE: 1/2" = 1'-0"

PANEL P2 - 5'-9" x 3'-0" SHOWN

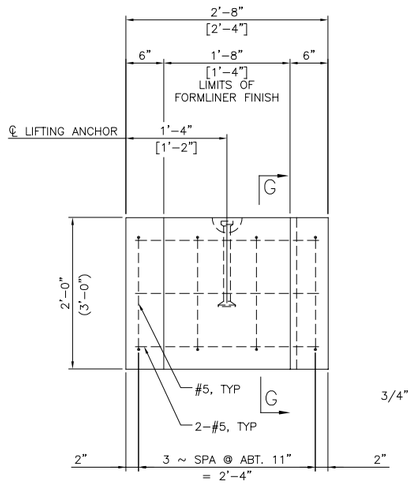
PANEL P3 - 5'-9 x 2'-0" [DIM]

DIMENSION LINES WITHOUT BRACKETS APPLY TO BOTH PANELS



SECTION F-F

SCALE: 1/2" = 1'-0"



PRECAST CONCRETE LAGGING PANEL P4 THRU P6

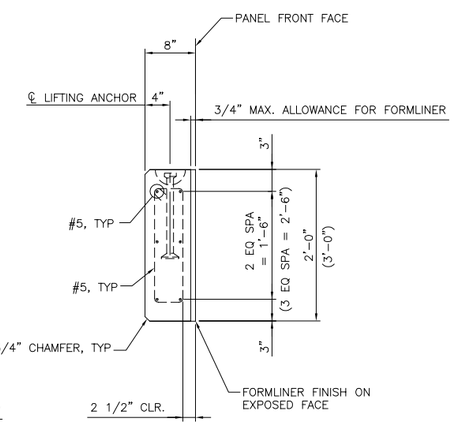
SCALE: 1/2" = 1'-0"

PANEL P4 - 2'-8" x 2'-0" SHOWN

PANEL P5 - 2'-4" x 2'-0" [DIM]

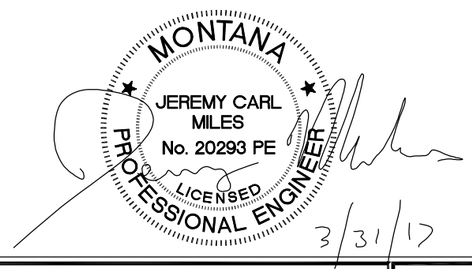
PANEL P6 - 2'-4" x 3'-0" (DIM)

DIMENSION LINES WITHOUT BRACKETS APPLY TO ALL PANELS



SECTION G-G

SCALE: 1/2" = 1'-0"



BY	DATE	REVISION DESCRIPTION

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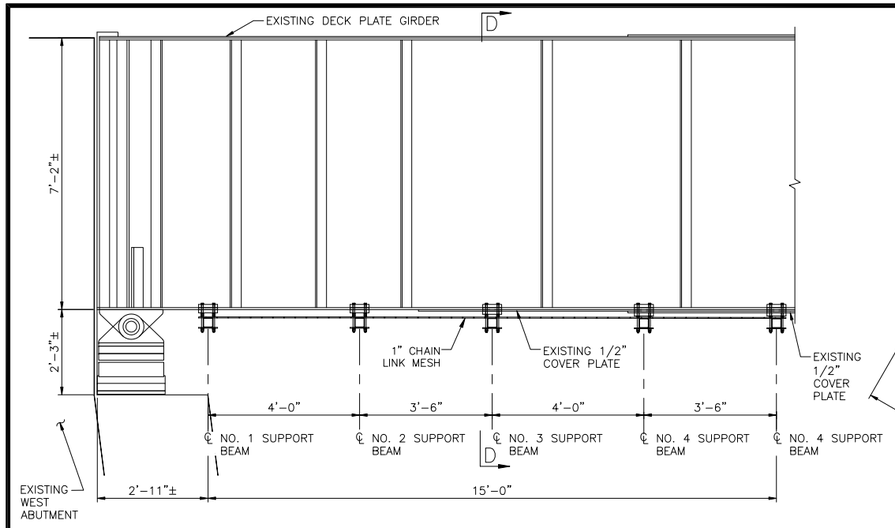
DRAWN AEG DATE 8/2016

CHECKED DLM SURVEYED DJ&A

MILLTOWN STATE PARK
DEPARTMENT OF FISH, WILDLIFE AND PARKS
TRAILS AND PARK FACILITIES DEVELOPMENT

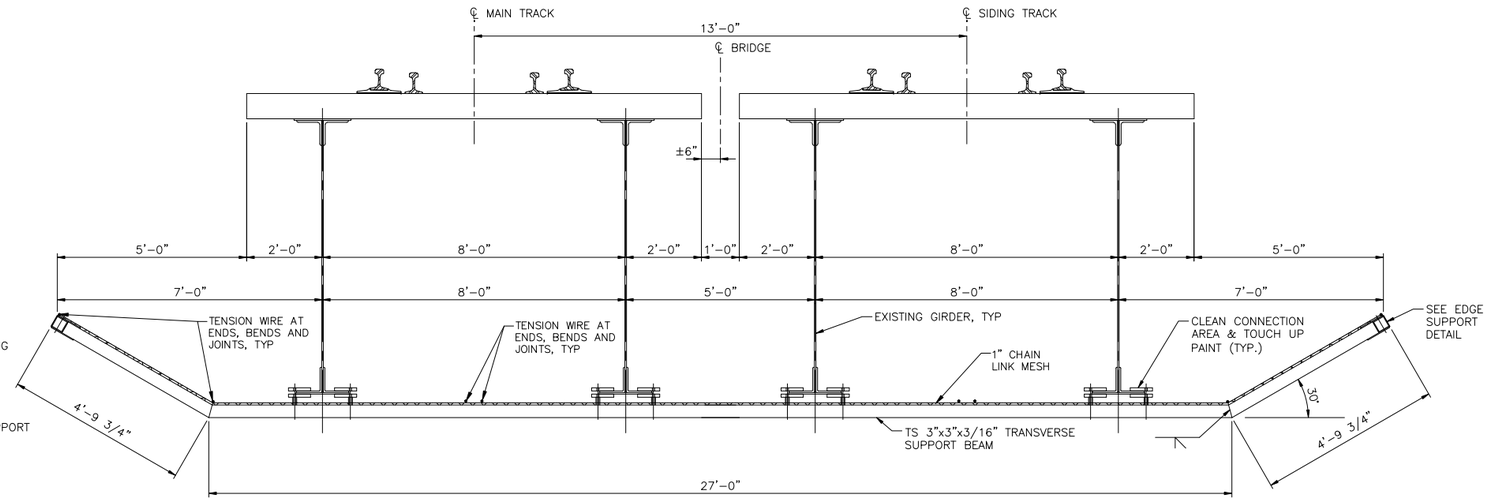
MRL BRIDGE 113.1 RETAINING WALLS
PRECAST CONCRETE LAGGING PANEL DETAILS

SHEET S13 OF S18



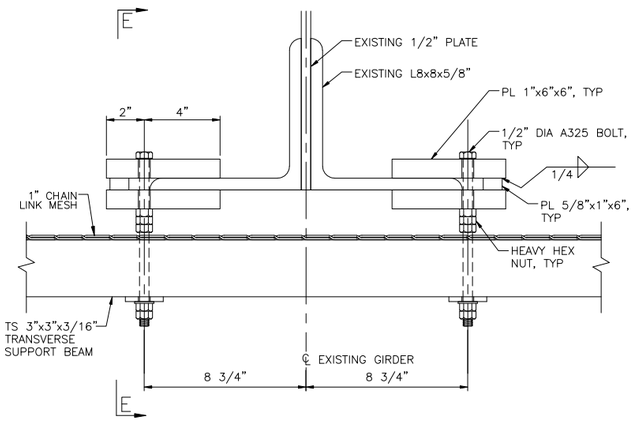
ELEVATION AT BRIDGE 113.1 WEST ABUTMENT

SCALE: 1/4" = 1'-0"



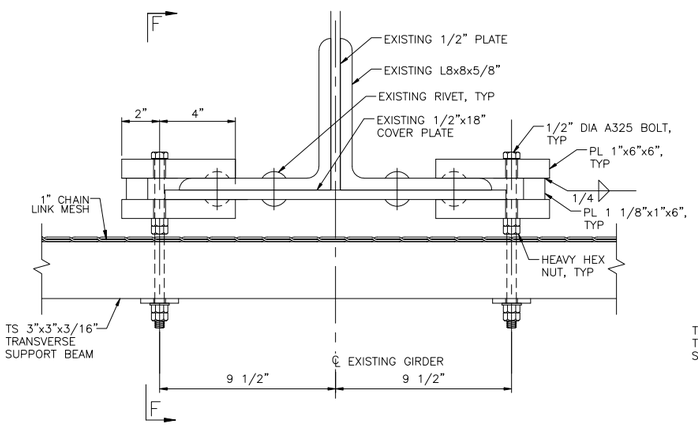
SECTION D–D

SCALE: 1/4" = 1'-0"



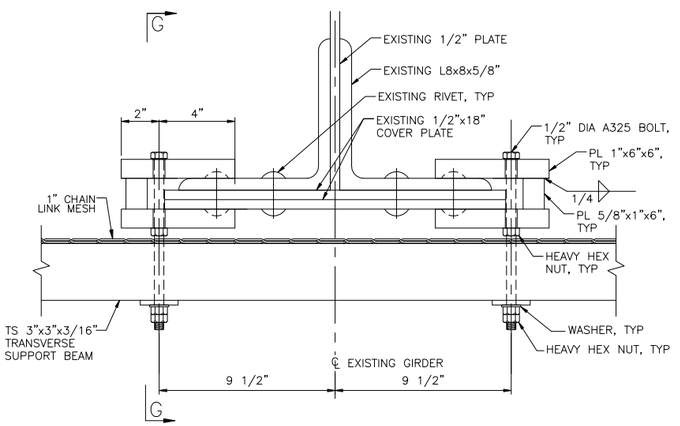
BEAM NO. 1 & 2 SUPPORT BEAM ATTACHMENT DETAIL

SCALE: 1 1/2" = 1'-0"



BEAM NO. 3 SUPPORT BEAM ATTACHMENT DETAIL

SCALE: 1 1/2" = 1'-0"



BEAM NO. 4 & 5 SUPPORT BEAM ATTACHMENT DETAIL

SCALE: 1 1/2" = 1'-0"

GENERAL NOTES

CONTRACTOR SHALL FIELD VERIFY EXISTING GIRDER DIMENSIONS BEFORE FABRICATION.

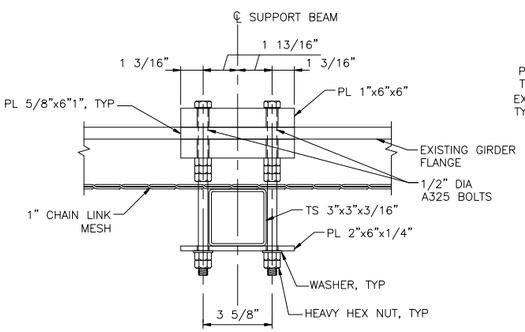
STEEL NOTES

ALL STRUCTURAL STEEL SHALL CONFORM TO A.S.T.M. A572, GRADE 50.

WELDING SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT A.W.S. WELDING CODE. WELDING SHALL BE PERFORMED BY PERSONNEL QUALIFIED PER CURRENT A.W.S. CODE D1.1.

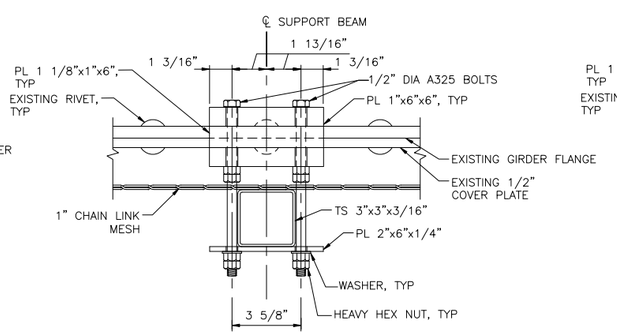
ALL FASTENERS SHALL BE HIGH STRENGTH BOLTS THAT CONFORM TO A.S.T.M. A325, TYPE 1. BOLTED CONNECTIONS SHALL BE HEAVY HEX WITH DOUBLE HEX NUTS OR A HEX NUT AND A JAM NUT WITH WASHER UNDER THE NUT.

CHAIN LINK MESH IS SHOWN AS THREE 144" SECTIONS, OTHER CONFIGURATIONS ARE ACCEPTABLE AS APPROVED BY THE ENGINEER.



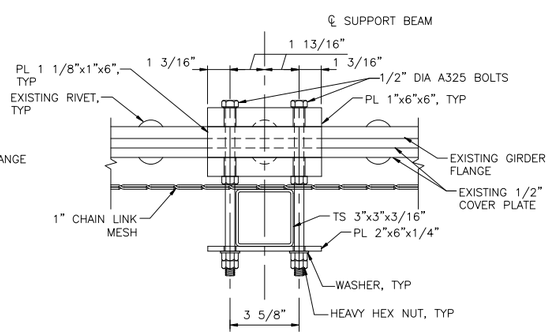
SECTION E–E

SCALE: 1 1/2" = 1'-0"



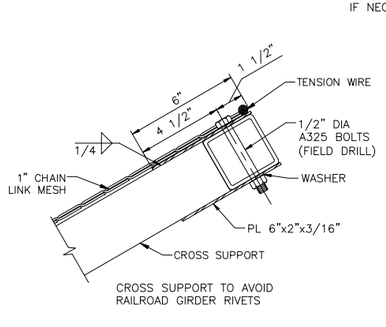
SECTION F–F

SCALE: 1 1/2" = 1'-0"



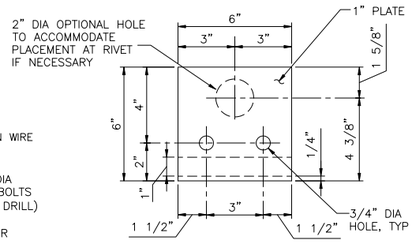
SECTION G–G

SCALE: 1 1/2" = 1'-0"



EDGE SUPPORT DETAIL

SCALE: 1 1/2" = 1'-0"



SUPPORT BEAM PLATE DETAIL

SCALE: 1 1/2" = 1'-0"

BY	DATE	REVISION DESCRIPTION

DESIGN BDM PROJ. NO. 5943
DRAWN ML DATE 3/2017
CHECKED MJ SURVEYED DJ&A

DJ&A, P.C.
CONSULTING ENGINEERS & LAND SURVEYORS
3203 Russell Street, Missoula, Montana 59801-8591
Phone 406/721-4320 Fax 406/549-6371

MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

MRL BRIDGE 113.1
ROOF STRUCTURE DETAILS

SHEET S14 OF S18

GENERAL NOTES

CONTRACTOR SHALL FIELD VERIFY EXISTING GIRDER DIMENSIONS BEFORE FABRICATION.

STEEL NOTES

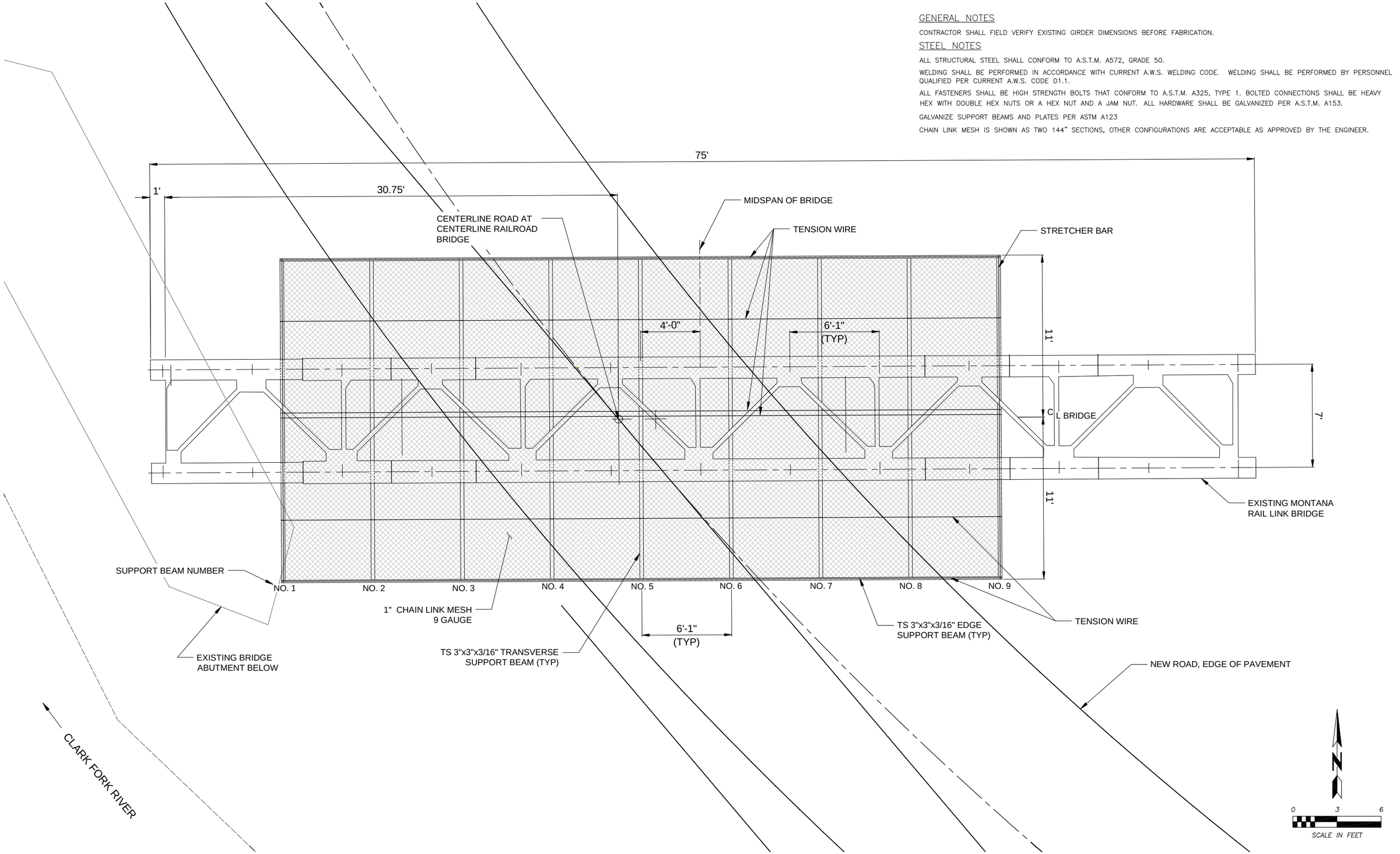
ALL STRUCTURAL STEEL SHALL CONFORM TO A.S.T.M. A572, GRADE 50.

WELDING SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT A.W.S. WELDING CODE. WELDING SHALL BE PERFORMED BY PERSONNEL QUALIFIED PER CURRENT A.W.S. CODE D1.1.

ALL FASTENERS SHALL BE HIGH STRENGTH BOLTS THAT CONFORM TO A.S.T.M. A325, TYPE 1. BOLTED CONNECTIONS SHALL BE HEAVY HEX WITH DOUBLE HEX NUTS OR A HEX NUT AND A JAM NUT. ALL HARDWARE SHALL BE GALVANIZED PER A.S.T.M. A153.

GALVANIZE SUPPORT BEAMS AND PLATES PER ASTM A123

CHAIN LINK MESH IS SHOWN AS TWO 144" SECTIONS, OTHER CONFIGURATIONS ARE ACCEPTABLE AS APPROVED BY THE ENGINEER.



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MONTANA STATE PARKS

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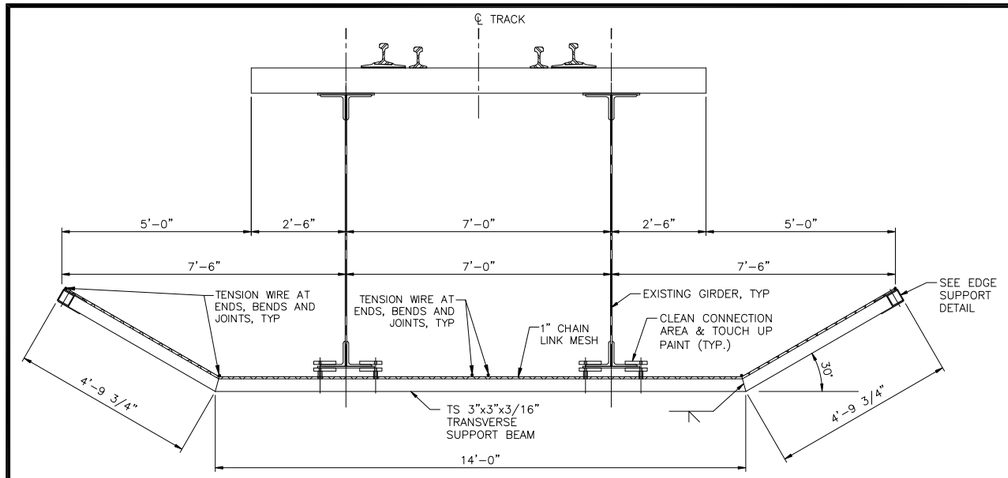
MILLTOWN STATE PARK

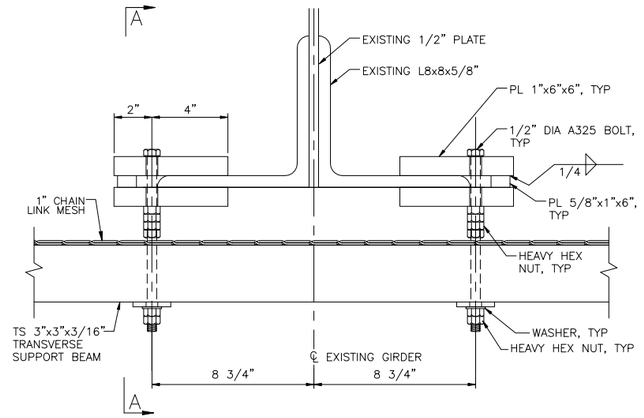
MRL BRIDGE 114.1
ROOF STRUCTURE DETAILS

SHEET S15 OF S18



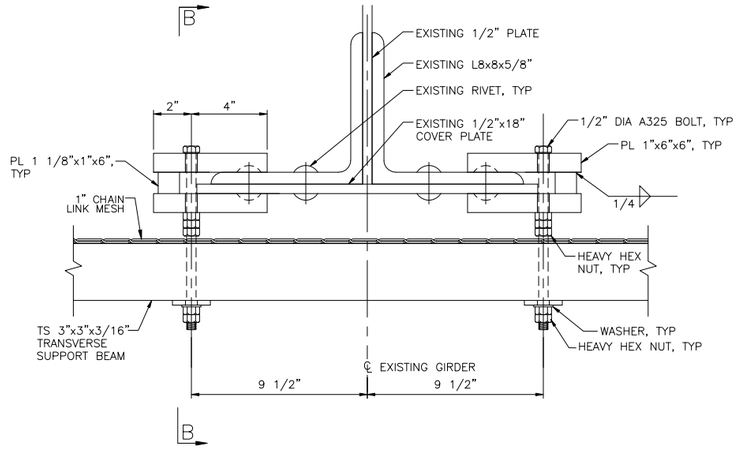
TYPICAL ROOF STRUCTURE SECTION

SCALE: 1/4" = 1'-0"



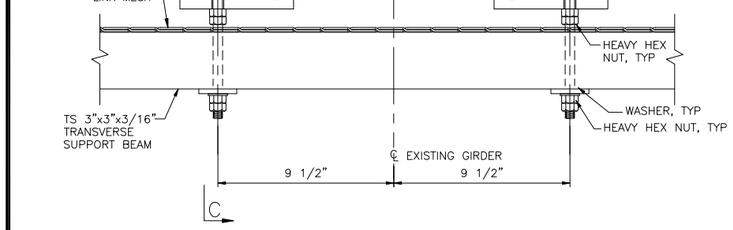
BEAM NO. 1 SUPPORT BEAM ATTACHMENT DETAIL

SCALE: 1 1/2" = 1'-0"



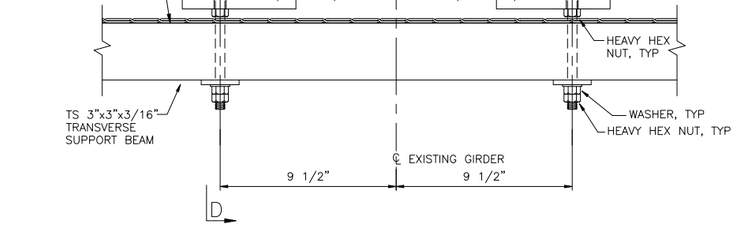
BEAM NO. 2 SUPPORT BEAM ATTACHMENT DETAIL

SCALE: 1 1/2" = 1'-0" (BEAMS NUMBERED FROM WEST TO EAST)



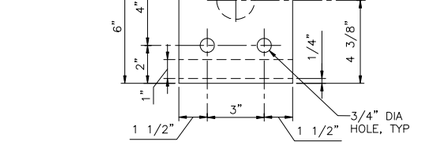
BEAMS NO. 3 & 9 SUPPORT BEAM ATTACHMENT DETAIL

SCALE: 1 1/2" = 1'-0" (BEAMS NUMBERED FROM WEST TO EAST)



BEAMS NO. 4 TO 8 SUPPORT BEAM ATTACHMENT DETAIL

SCALE: 1 1/2" = 1'-0" (BEAMS NUMBERED FROM WEST TO EAST)



SUPPORT BEAM PLATE DETAIL

SCALE: 1 1/2" = 1'-0"

GENERAL NOTES

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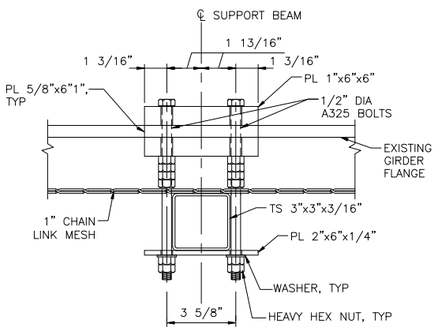
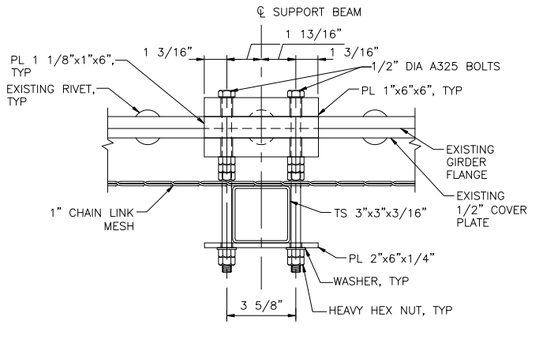
CHAIN LINK MESH IS SHOWN AS TWO 144" SECTIONS, OTHER CONFIGURATIONS ARE ACCEPTABLE AS APPROVED BY THE ENGINEER.



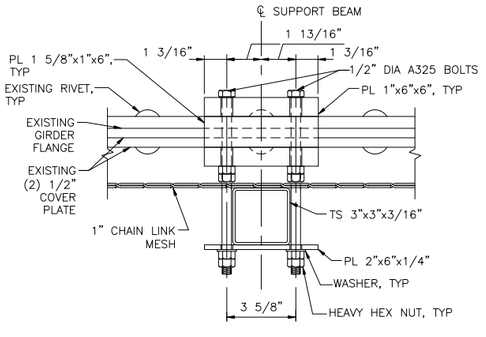
SECTION A-A

SCALE: 1 1/2" = 1'-0"



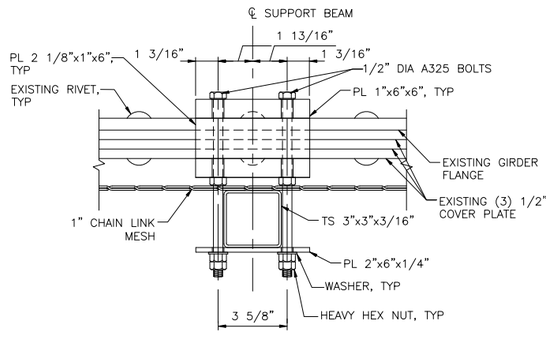
SECTION B-B

SCALE: 1 1/2" = 1'-0"



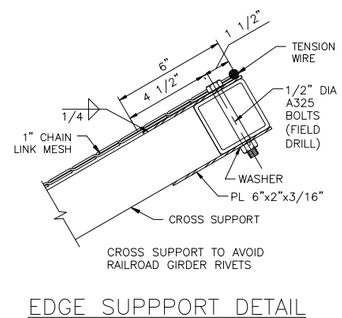
SECTION C-C

SCALE: 1 1/2" = 1'-0"



SECTION D-D

SCALE: 1 1/2" = 1'-0"



EDGE SUPPPORT DETAIL

SCALE: 1 1/2" = 1'-0"

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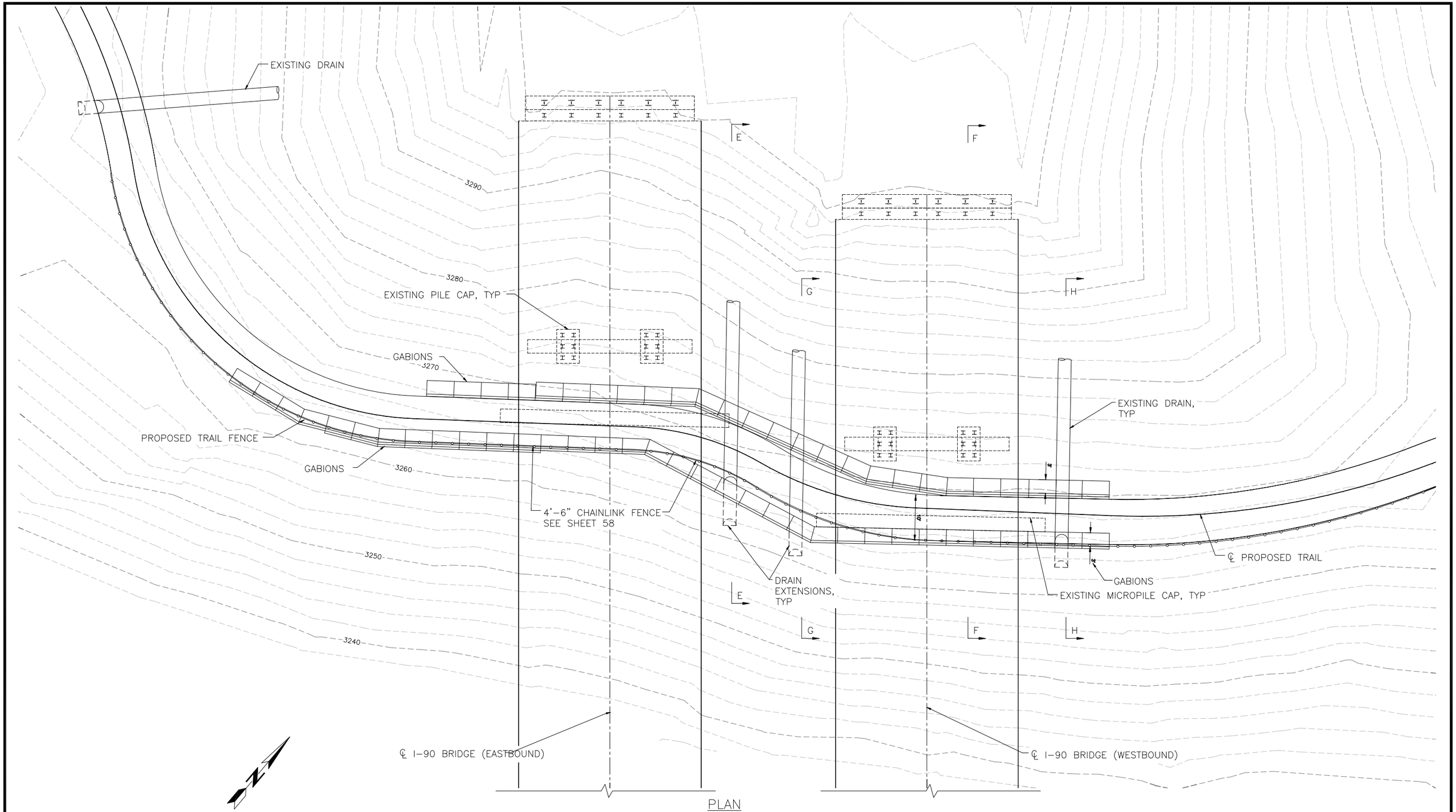
MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

MRL BRIDGE 114.1
ROOF STRUCTURE DETAILS

SHEET S16 OF S18



PLAN

REFERENCES

SEE SHEET S18 FOR SECTIONS

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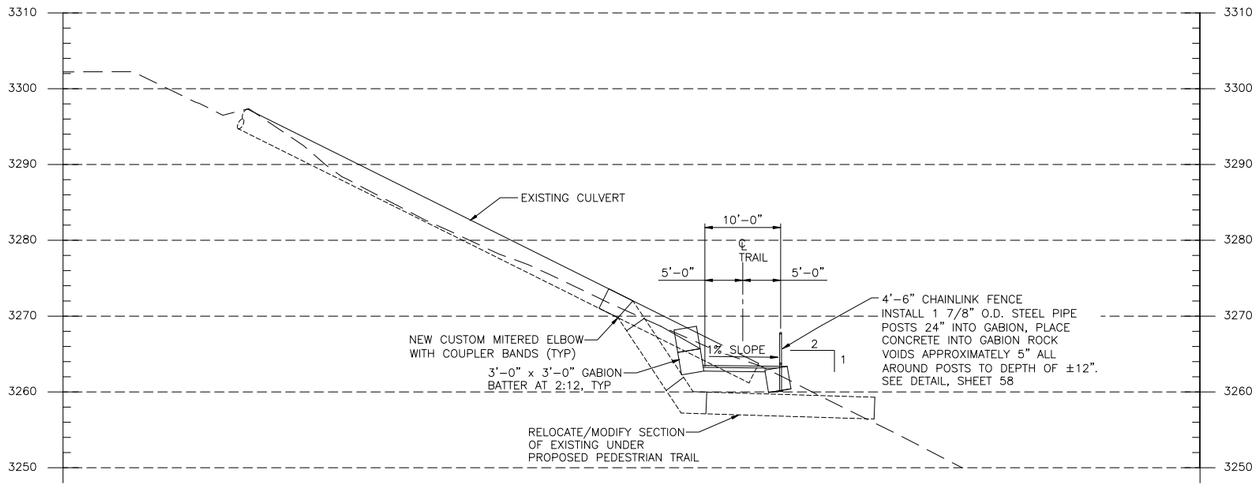
MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

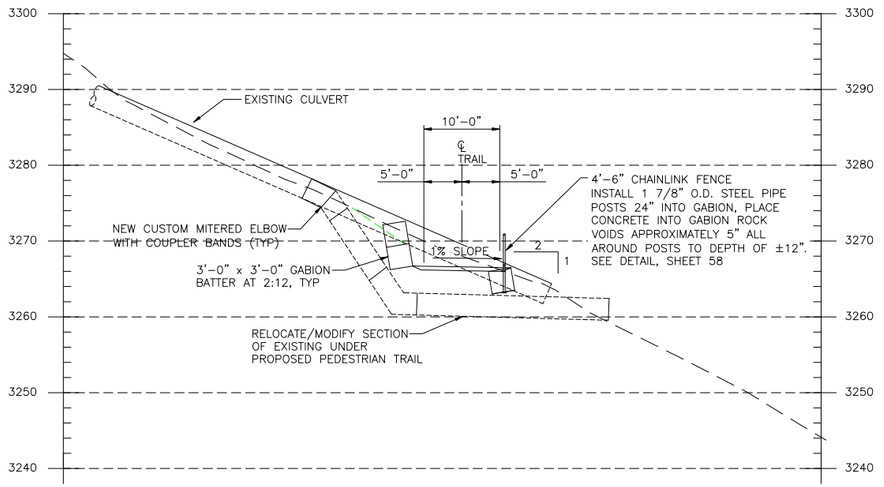
NOT INCLUDED IN THIS PROJECT
I-90 BRIDGE RETAINING WALLS
PLAN AND ELEVATION

SHEET S17 OF S18



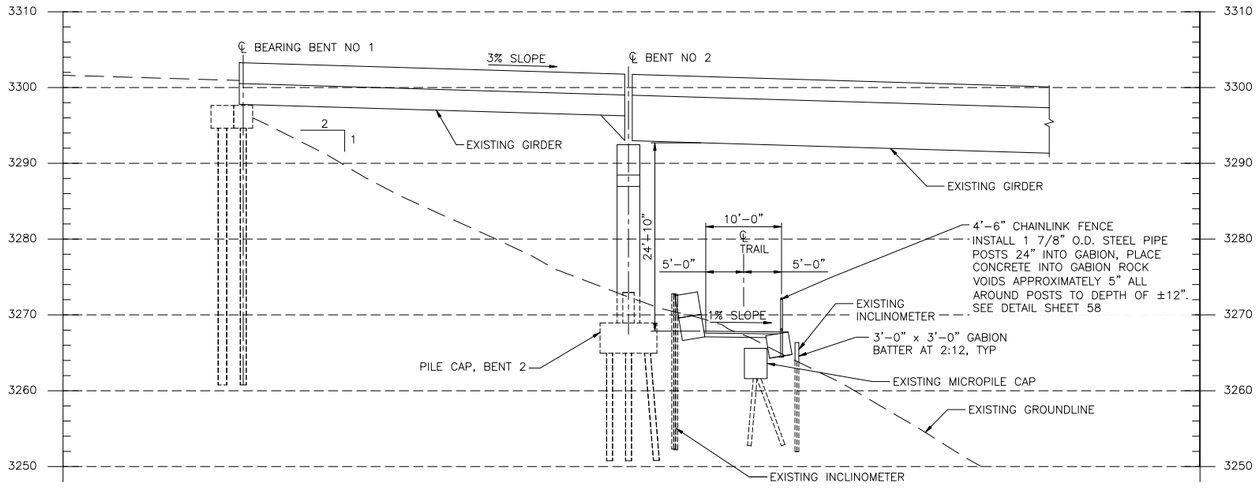
SECTION E–E

SCALE: 1" = 20'–0"



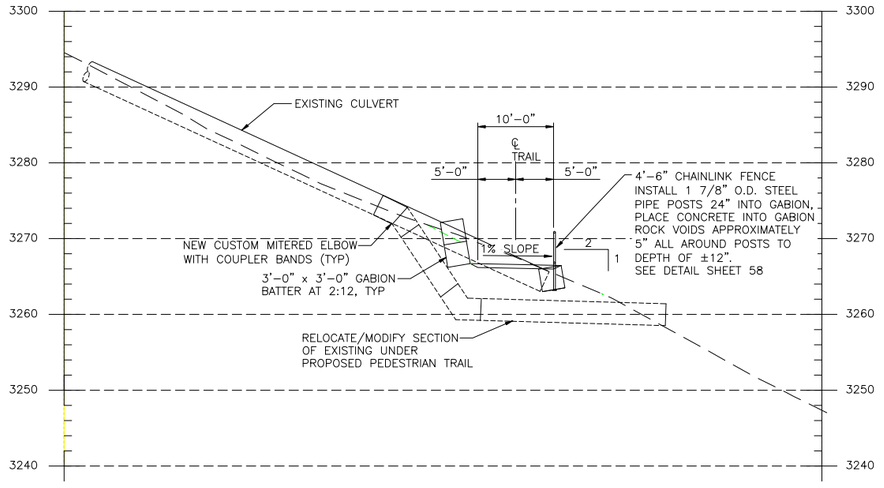
SECTION G–G

SCALE: 1" = 20'–0"



SECTION F–F

SCALE: 1" = 20'–0"



SECTION H–H

SCALE: 1" = 20'–0"

REFERENCES

SEE SHEET S17 FOR LOCATION OF SECTIONS

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MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

NOT INCLUDED IN THIS CONTRACT
I-90 BRIDGE RETAINING WALLS
TYPICAL SECTIONS AND RETAINING WALL DETAILS

SHEET S18 OF S18

GENERAL PROJECT NOTES

A. COORDINATE THE INSTALLATION OF ELECTRICAL MATERIAL ITEMS WITH THE PROJECT ENGINEER.

B. FIELD VERIFY DIMENSIONS AND INSTALLED INFRASTRUCTURE USING THE CIVIL ENGINEERING DRAWINGS.

C. THE SECONDARY FEEDER CONDUCTOR SHALL BE #2 AL, TRIPLEX (2 HOTS, 1 NEUTRAL) WITH THE ADDITION OF A SINGLE INSULATED #6 AL GROUND WIRE.

D. INSTALL DIRECT BURY BRANCH CIRCUITS, FEEDERS, AND SERVICE CONDUCTORS IN SCHEDULE 80 PVC SLEEVES WHEN PASSING UNDER PAVEMENT IN PARKING LOTS AND TRAILS.

SCHEDULE 80 PVC SLEEVES SHALL ALSO BE USED TO PROTECT UNDERGROUND FEEDERS AND BRANCH CIRCUITS WHEN THEY ARE INSTALLED ABOVE BURIAL DEPTH AS IN SUPPLIES TO POLE MOUNTED LIGHT FIXTURES. SLEEVES SHALL BE TERMINATED WITH A SWEEP ELBOW AT BURIAL DEPTH.

E. COORDINATE WITH NORTHWESTERN ENERGY TO ADD AN UNDERGROUND PRIMARY EXTENSION TO THEIR EXISTING OVERHEAD LINE, A NEW PAD MOUNTED TRANSFORMER, AND A NEW 200 AMP SERVICE AS INDICATED ON THESE DRAWINGS.

F. THE WORD 'CONTRACTOR' ON THESE ELECTRICAL DRAWINGS MEANS THE ENTIRE CONTRACTOR TEAM.

G. THE WORD 'COORDINATE' MEANS WORK WITH THE ENTITY TO PROVIDE THOSE CONTRACTOR SERVICES THAT MAY BE REQUIRED TO ACCOMPLISH THE WORK. FOR EXAMPLE, 'COORDINATE WITH NWE' MEANS PROVIDE SUPPORT TYPICALLY REQUIRED FOR INSTALLATION OF PRIMARY AND SECONDARY SERVICES. THIS COULD INCLUDE TRENCHING, CONDUIT INSTALLATION, AND CONDUIT STUB INSTALLATION. PROVIDE ALSO EQUIPMENT, INCLUDING METER SOCKETS, THAT MEET WITH NWE APPROVAL.

H. COMPLY WITH PROVISIONS OF APPLICABLE CODES AND REQUIREMENTS FROM LOCAL AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICTING GUIDELINES BETWEEN MULTIPLE DIRECTIVES, THE MOST RESTRICTIVE WILL PREVAIL.

I. CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF PROJECT REQUIREMENTS AND PROVISION OF ADEQUATE AND TIMELY INFORMATION TO ALL TRADES CONCERNED FOR MATTERS INVOLVING MULTIPLE TRADES.

J. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL UTILITY LOCATES.

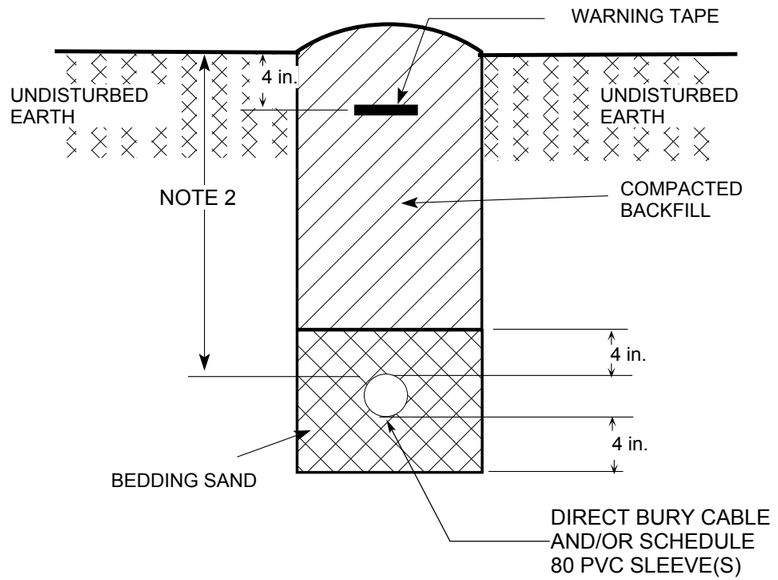
K. CATALOG SHEETS ARE INCLUDED WITH THE DRAWING SET FOR CONTRACTOR UNDERSTANDING. THE CONTRACTOR SHALL OBTAIN A COMPLETE DRAWING PACKAGE FOR BOTH BIDDING AND CONSTRUCTION. ANYTHING LESS WILL PROVIDE INSUFFICIENT INFORMATION FOR THE CONTRACTOR TO PROPERLY BID AND CONSTRUCT THIS PROJECT.

L. SPECIFICATIONS ARE INCLUDED IN THE GENERAL PROJECT SPECIFICATION BOOK.

M. THE SYSTEM VOLTAGE FOR THIS PROJECT IS 120/240 VAC SINGLE PHASE.

N. A #6 AL GROUND IS INSTALLED IN THE MAIN TRAIL LIGHTING BRANCH CIRCUITS TO PROVIDE POSSIBLE FUTURE 120 VOLT LOADS.

INDEX OF ELECTRICAL SHEETS



NOTES:
1. SINGLE CONDUIT SHOWN. MULTIPLE CONDUITS CAN BE USED.
2. BURIAL DEPTH 24 INCHES MINIMUM.
3. IF MORE THAN ONE CABLE OR CONDUIT OF THE SAME FACILITY IS INSTALLED IN A TRENCH, THE CONDUITS SHALL BE SEPARATED BY 9 INCHES MINIMUM.
4. INSTALL CONDUITS 24 INCHES (UNLESS OTHERWISE NOTED) BELOW FOOTING FOUNDATION OR PAVEMENT BASE FILL.
5. CONDUIT OR CONDUITS SHALL NOT BE LOCATED ANY CLOSER THAN 3 INCHES FROM TRENCH SIDE WALL.

TRENCHING AND BEDDING DETAIL

NOT TO SCALE

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MONTANA
MICHAEL T. FUSSELL
7982 E
REGISTERED
PROFESSIONAL ENGINEER

BY	DATE	REVISION DESCRIPTION

DESIGN MTF PROJ. NO 5943
DRAWN MTF DATE 05/2016
CHECKED MTF SURVEYED DJ&A

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MONTANA STATE PARKS
REAL MONTANA. REAL CLOSE

MT FISH, WILDLIFE & PARKS
MILLTOWN STATE PARK

ELECTRICAL PLAN INDEX

072216

SHEET E 0.0 OF 11

SHEET SPECIFIC NOTES

1. FURNISH AND INSTALL A 2 INCH SCHEDULE 80 PVC CONDUIT SLEEVE(S) AS INDICATED UNDER THE PAVEMENT IN ACCORDANCE WITH THE TRENCHING DETAIL. EXTEND SLEEVE AT LEAST 3 FEET BEYOND EDGE OF PAVEMENT. INSTALL FRICTION FIT CAP ON EACH END OF THE SLEEVE EXCEPT FOR SLEEVES THAT ARE GOING TO BE USED FOR THIS PROJECT.

MARK WITH A 2 FOOT PIECE OF SCRAP RE-BAR LOCATED ABOVE EACH END OF THE SLEEVE FOR FUTURE DETECTION BY A METAL DETECTOR EXCEPT FOR SLEEVES USED IN THIS PROJECT.

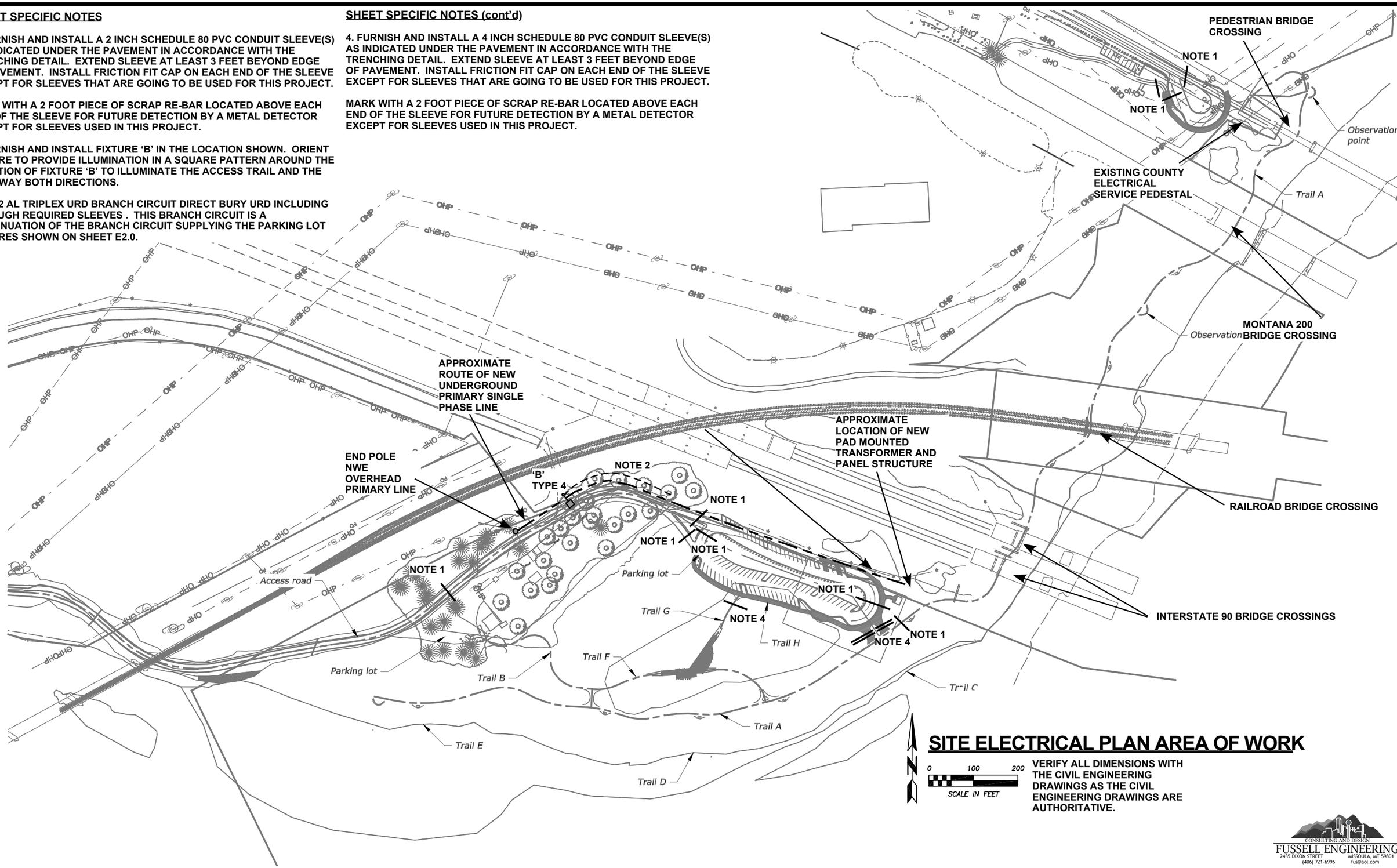
2. FURNISH AND INSTALL FIXTURE 'B' IN THE LOCATION SHOWN. ORIENT FIXTURE TO PROVIDE ILLUMINATION IN A SQUARE PATTERN AROUND THE LOCATION OF FIXTURE 'B' TO ILLUMINATE THE ACCESS TRAIL AND THE ROADWAY BOTH DIRECTIONS.

USE #2 AL TRIPLEX URD BRANCH CIRCUIT DIRECT BURY URD INCLUDING THROUGH REQUIRED SLEEVES . THIS BRANCH CIRCUIT IS A CONTINUATION OF THE BRANCH CIRCUIT SUPPLYING THE PARKING LOT FIXTURES SHOWN ON SHEET E2.0.

SHEET SPECIFIC NOTES (cont'd)

4. FURNISH AND INSTALL A 4 INCH SCHEDULE 80 PVC CONDUIT SLEEVE(S) AS INDICATED UNDER THE PAVEMENT IN ACCORDANCE WITH THE TRENCHING DETAIL. EXTEND SLEEVE AT LEAST 3 FEET BEYOND EDGE OF PAVEMENT. INSTALL FRICTION FIT CAP ON EACH END OF THE SLEEVE EXCEPT FOR SLEEVES THAT ARE GOING TO BE USED FOR THIS PROJECT.

MARK WITH A 2 FOOT PIECE OF SCRAP RE-BAR LOCATED ABOVE EACH END OF THE SLEEVE FOR FUTURE DETECTION BY A METAL DETECTOR EXCEPT FOR SLEEVES USED IN THIS PROJECT.



SITE ELECTRICAL PLAN AREA OF WORK

0 100 200

SCALE IN FEET

VERIFY ALL DIMENSIONS WITH THE CIVIL ENGINEERING DRAWINGS AS THE CIVIL ENGINEERING DRAWINGS ARE AUTHORITATIVE.

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FUSSELL ENGINEERING
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MONTANA STATE PARKS

MT FISH, WILDLIFE & PARKS

MILLTOWN STATE PARK

GENERAL AREA OF ELECTRICAL WORK

072216

SHEET E 1.0 OF 11

SHEET SPECIFIC NOTES

1. COORDINATE WITH NWE REGARDING THE INSTALLATION OF A NEW UNDERGROUND 7.2 KV EXTENSION OF THEIR OVERHEAD LINE TO THE TRANSFORMER LOCATION.

2. IN THIS AREA, NWE WILL INSTALL A 120/240 SINGLE PHASE PAD MOUNTED TRANSFORMER AND A 200 AMP SERVICE TO THE CONTRACTOR INSTALLED METER BASE/LOAD CENTER.

THE CONTRACTOR SHALL INSTALL A 200 AMP, 120/240 VAC, SINGLE PHASE COMBINATION METER BASE/LOAD CENTER AS INDICATED ON THE CATALOG SHEET DRAWINGS.

3. FURNISH AND INSTALL FIXTURE 'B' IN THE LOCATION SHOWN. ORIENT FIXTURE TO PROVIDE ILLUMINATION OF THE TOILET FACILITY ENTRANCE, THE TRAIL HEAD AREA, AND A PORTION OF THE PARKING LOT, IN THIS ORDER.

USE #2 AL TRIPLEX URD WIRE BRANCH CIRCUIT DIRECT BURY URD INCLUDING THROUGH SLEEVES. PROTECT WITH A 2 POLE, 30 AMP BREAKER IN THE LOAD CENTER.

SHEET SPECIFIC NOTES CONT'D

4. FURNISH AND INSTALL FIXTURE 'A' IN THE LOCATIONS SHOWN. ORIENT FIXTURE TO PROVIDE TRAIL LIGHTING AS WELL AS ILLUMINATING THE AREA UNDER THE BRIDGE INCLUDING THE AREA NEAR WHERE THE BRIDGE DECK MEETS THE GRADE LEVEL.

USE #2 AL TRIPLEX URD + #6 AL GROUND WIRE DIRECT BURY INCLUDING THROUGH SLEEVES FOR THE BRANCH CIRCUIT. PROTECT BRANCH CIRCUIT WITH A 2 POLE, 30 AMP BREAKER IN THE LOAD CENTER.

5. END BRANCH CIRCUIT IN AN IN-THE-GROUND JUNCTION BOX NEAR THE BASE OF THE LAST FIXTURE 'A'. THUS THE BRANCH CIRCUIT COULD BE EXTENDED FROM THE JUNCTION BOX AT A LATER TIME TO SUPPLY 120 AND 240 VOLT LOADS.

6. FURNISH AND INSTALL A SCHEDULE 80 PVC SLEEVE TO PROTECT THE DIRECT BURY URD BRANCH CIRCUIT AS IT PASSES UNDERNEATH THE TRAIL. AT THE END OF THE PVC SLEEVE, FURNISH AND INSTALL AN IN-THE-GROUND JUNCTION BOX WITH SUFFICIENT SLACK TO ALLOW A FUTURE EXTENSION OF THE BRANCH CIRCUIT TO THE WEST.

SHEET SPECIFIC NOTES CONT'D

7. FURNISH AND INSTALL FIXTURE 'B' IN THE LOCATION SHOWN. ORIENT FIXTURE TO PROVIDE ILLUMINATION OF THE PARKING LOT AS INDICATED.

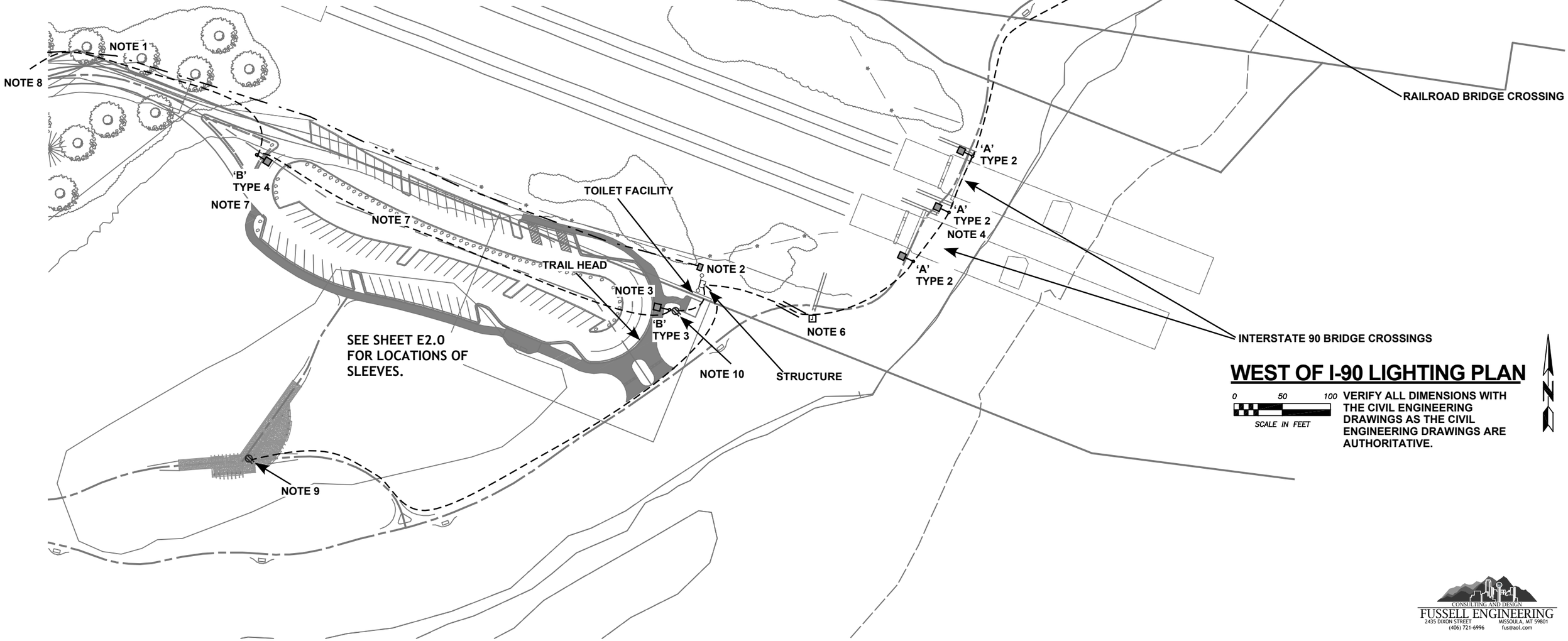
USE #2 AL TRIPLEX URD DIRECT BURY URD INCLUDING THROUGH PVC SLEEVES. THIS IS A CONTINUATION OF THE BRANCH CIRCUIT DESCRIBED IN NOTE 3, THIS SHEET. USE SLEEVES AS DESCRIBED ON SHEET E1.0.

8. TO FIXTURE 'B' LOCATED ON SHEET E1.0.

9. FURNISH AND INSTALL GFCI NEMA 5-20R RECEPTACLE WITH A WP COVER IN THE STONE WALL. SEE STRUCTUAL DRAWINGS. POWER FROM METER MAIN LOAD CENTER USING DIRECT BURY #10 UF AND A SINGLE POLE 20 AMP BREAKER. USE EMT ABOVE GRADE, SCHEDULE 80 PVC CONDUIT BELOW GRADE DOWN TO BURIAL DEPTH.

SHEET SPECIFIC NOTES CONT'D

10. FURNISH AND INSTALL GFCI NEMA 5-20R RECEPTACLE WITH A WP COVER IN THE LIGHT POLE. POWER FROM METER MAIN LOAD CENTER USING 3 — #12 THWN CU CONDUCTORS (HOT, NEUTRAL, GROUND) IN SCHEDULE 80 PVC CONDUIT AND A SINGLE POLE 20 AMP BREAKER. USE EMT ABOVE GRADE
.



WEST OF I-90 LIGHTING PLAN

0 50 100
SCALE IN FEET

VERIFY ALL DIMENSIONS WITH THE CIVIL ENGINEERING DRAWINGS AS THE CIVIL ENGINEERING DRAWINGS ARE AUTHORITATIVE.

N

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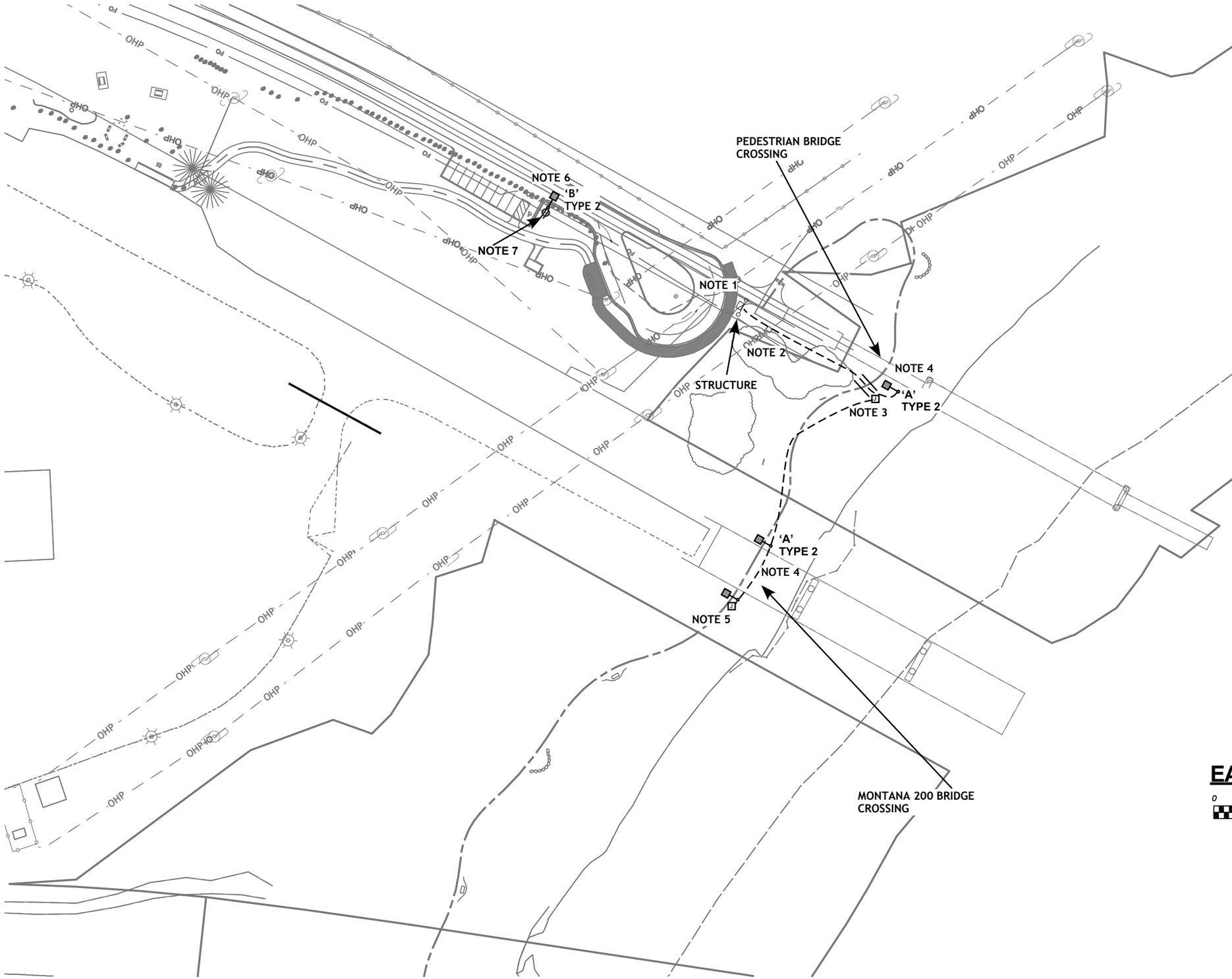
MONTANA STATE PARKS
REAL MONTANA REAL LIGHT

MT FISH, WILDLIFE & PARKS
MILLTOWN STATE PARK

ELECTRICAL SITE PLAN
AREA WEST OF I-90
072216

SHEET E 2.0 OF 11



SHEET SPECIFIC NOTES

1. THE CONTRACTOR SHALL INSTALL A 200 AMP, 120/240 VAC, SINGLE PHASE COMBINATION METER BASE/LOAD CENTER AS INDICATED ON THE CATALOG SHEET AND STRUCTURE DRAWINGS.

TAP THE EXISTING SERVICE SUPPLYING THE COUNTY METER/LOAD CENTER LOCATED ADJACENT TO THE BRIDGE ABUTMENT. SEE PHOTO SHEET E4.0. EXTEND THE EXISTING SERVICE TO THE NEW METER BASE/LOAD CENTER LOCATED ON THE STRUCTURE. COORDINATE WITH NWE.

LOCATE THE NEW METER BASE/LOAD CENTER COMBINATION NEAR THE COUNTY ELECTRICAL SERVICE WITHOUT BLOCKING ACCESS TO THE EXISTING COUNTY SERVICE. WHEN COMPLETED, A SINGLE NWE SERVICE WILL SUPPLY BOTH THE EXISTING COUNTY ELECTRICAL SERVICE AND THE NEW STATE PARK ELECTRICAL SERVICE.

2. ROUTE THE NEW BRANCH CIRCUIT DOWN THE EMBANKMENT TO THE TRAIL LOCATION. IT IS ACCEPTABLE TO FOLLOW THE TRAIL AROUND THE SWITCHBACK. IF SO, THEN A SCHEDULE 80 PVC SLEEVE WILL BE REQUIRED UNDERNEATH THE EXISTING COUNTY TRAIL.

3. FURNISH AND INSTALL A SCHEDULE 80 PVC SLEEVE TO PROTECT THE DIRECT BURY URD BRANCH CIRCUIT AS IT PASSES UNDERNEATH THE TRAIL. AT THE END OF THE PVC SLEEVE, FURNISH AND INSTALL AN IN-THE-GROUND JUNCTION BOX TO PROVIDE A 'T' JUNCTION EAST AND WEST AS INDICATED.

4. FURNISH AND INSTALL FIXTURE 'A' IN THE LOCATIONS SHOWN. ORIENT FIXTURE TO PROVIDE TRAIL LIGHTING AS WELL AS ILLUMINATING THE AREA UNDER THE BRIDGE INCLUDING THE AREA NEAR WHERE THE BRIDGE DECK MEETS THE GRADE LEVEL.

USE #2 AL TRIPLEX URD + #6 AL GROUND WIRE DIRECT BURY URD INCLUDING THROUGH SLEEVES AS THE BRANCH CIRCUIT. PROTECT BRANCH CIRCUIT WITH A 2 POLE, 30 AMP BREAKER IN THE LOAD CENTER.

5. END BRANCH CIRCUIT IN AN IN-THE-GROUND JUNCTION BOX NEAR THE BASE OF THE LAST FIXTURE 'A'. THUS THE BRANCH CIRCUIT COULD BE EXTENDED FROM THE JUNCTION BOX AT A LATER TIME FOR BOTH 120 VAC AND 240 VAC LOADS.

6. POWER FIXTURE 'B' USING #10 CU UF DIRECT BURY IN ACCORDANCE WITH THE TRENCHING DETAIL AND THE POLE BASE MOUNTING DETAIL. POWER FROM A SINGLE POLE 20 AMP BREAKER IN THE METER MAIN LOAD CENTER INSTALLED IN NOTE 1 THIS SHEET.

7. FURNISH AND INSTALL GFCI NEMA 5-20R RECEPTACLE WITH A WP COVER IN THE LIGHT POLE. POWER FROM EXISTING METER MAIN LOAD CENTER USING 3 — #12 THWN CU CONDUCTORS (HOT, NEUTRAL, GROUND) IN SCHEDULE 80 PVC CONDUIT AND A SINGLE POLE 20 AMP BREAKER. USE EMT ABOVE GRADE

EAST OF I-90 LIGHTING PLAN

0 50 100
SCALE IN FEET

VERIFY ALL DIMENSIONS WITH THE CIVIL ENGINEERING DRAWINGS AS THE CIVIL ENGINEERING DRAWINGS ARE AUTHORITATIVE.

N

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BY	DATE	REVISION DESCRIPTION

DESIGN MTF PROJ. NO 5943
DRAWN MTF DATE 05/2016
CHECKED MTF SURVEYED DJ&A

DJ&A, P.C.
CONSULTING ENGINEERS & LAND SURVEYORS
3203 Russell Street, Missoula, Montana 59801-8591
Phone 406/721-4320 Fax 406/549-6371

MONTANA STATE PARKS

MT FISH, WILDLIFE & PARKS
MILLTOWN STATE PARK

ELECTRICAL SITE PLAN
AREA EAST OF I-90

072216

SHEET E 3.0 OF 11

EXTEND THE EXISTING NWE SERVICE THAT TERMINATES IN THE EXISTING COUNTY METER/LOAD CENTER COMBINATION TO THE NEW STATE METER/LOAD CENTER STRUCTURE.

LOCATE THE NEW STATE METER/SERVICE ENTRANCE STRUCTURE NEAR THE EXISTING COUNTY SERVICE BUT RECOGNIZE THAT THERE APPEARS TO BE A CONSIDERABLE NUMBER OF EXISTING BURIED FACILITIES THAT MUST BE AVOIDED.

COORDINATE THE SERVICE EXTENSION WITH NWE.

EXISTING COUNTY SERVICE

EXISTING BRIDGE ABUTMENT

PHOTO E4.0-1 EXISTING COUNTY ELECTRICAL SERVICE AT PEDESTRIAN BRIDGE

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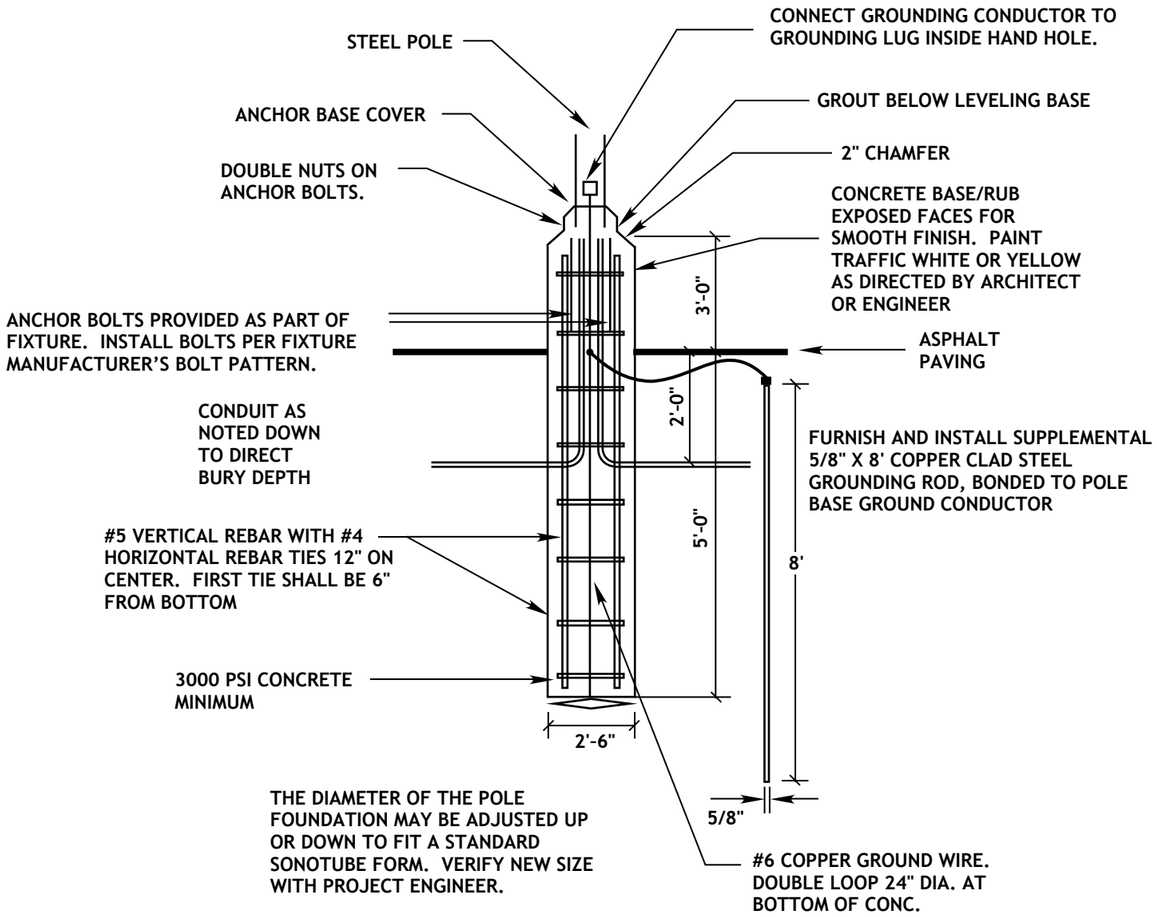
ELECTRICAL PHOTOS

072216

SHEET E 4.0 OF 11



POLE BASE DETAIL

NOT TO SCALE

FIXTURES 'A' AND 'B'
ROAD LIGHTS
GENERAL
The contractor furnishes and installs Trail Lighting and Parking Lot Lighting Fixture 'A' and 'B' mounted on steel poles as indicated on this sheet and in the catalog sheets.

FIXTURE PACKAGE
The contractor shall furnish and install the complete light fixture package including base, base concrete, anchor, pole, pole mounts, and the light fixture.

FOUNDATION
GENERAL
The contractor shall furnish and install concrete foundations for each of the trail light and parking lot light fixture poles in accordance with these specifications and the manufacturer's recommendation. The manufacturer of the pole base should have a bolt pattern for the correct installation of the anchor bolts.

Note: Coordination with the general contractor with regards to concrete will be required to reduce costs. The electrical contractor will be responsible for seeing that the concrete foundations for lighting fixtures are installed in accordance with the manufacturer's specifications and that anchor bolts as needed are installed in accordance with the manufacturer's template.

CONCRETE SPECIFICATION
If the concrete specification for the civil engineering portion of the project does not apply to the light fixture foundation, the following specification shall govern.

Each concrete foundation shall be accordance with the detail located below. The length and width dimensions shall be governed by the manufacturer's recommendation. The manufacturer's template shall be used to position the mounting bolts. The concrete shall be 3000 PSI. The reinforcing rods shall be such that no point of the reinforcing rod is within 6 inches of the concrete surface. The reinforcing rods shall be tacked or wired together.

GROUNDING
Bond the ground conductor in the street light supply branch circuit to the pole base ground lug.

FUSING
Each road light shall be equipped with individual fusing, one for each hot conductor.

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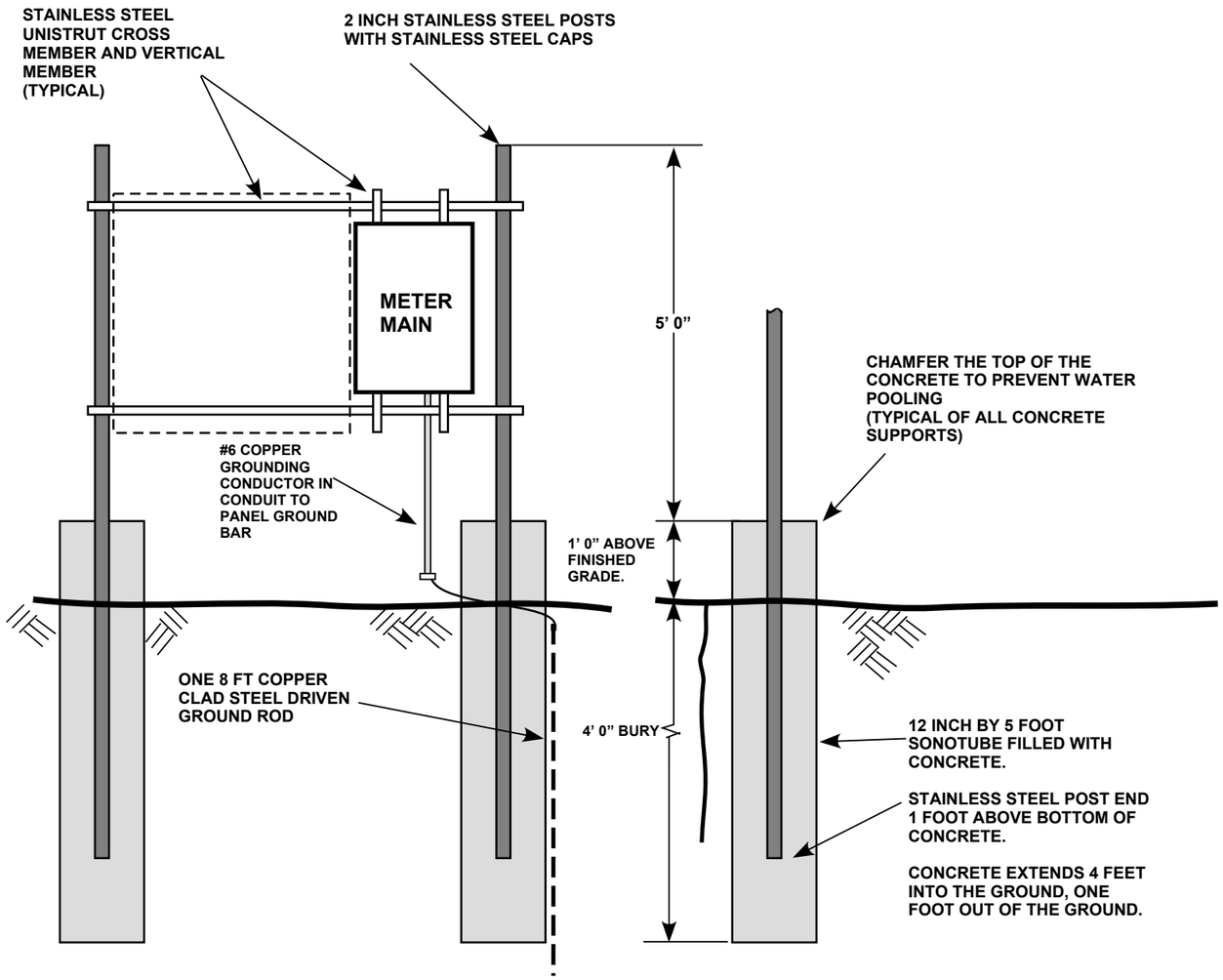
ELECTRICAL DETAILS
072216

SHEET E 5.0 OF 11



STRUCTURE ELEVATION

NOT TO SCALE

SHEET GENERAL NOTES:

A. USE EMT CONDUIT FOR ALL INTERCONNECTIONS BETWEEN EQUIPMENT ON THE STRUCTURE. CONTINUE SCHEDULE 80 PVC CONDUITS FOR UNDERGROUND CIRCUITS UP TO EQUIPMENT ON THE STRUCTURE.

B. ADJUST THE DIMENSIONS BETWEEN THE POSTS TO SUPPORT THE METER MAIN.

INSTALLATION NOTE:

A. FOR THE INSTALLATION OF THE METER MAIN AT THE TOILET FACILITY, A STRUCTURE IS SHOWN ADJACENT TO THE REAR OF THE TOILET FACILITY.

IF POSSIBLE, ELIMINATE THE STRUCTURE AND MOUNT THE EQUIPMENT DIRECTLY TO THE CONCRETE REAR WALL USING THE APPROPRIATE METHODS FOR A PRE-CAST CONCRETE WALL.

USE THE STRUCTURE CONFIGURATION IF AND ONLY IF MOUNTING DIRECTLY TO THE REAR WALL OF THE TOILET BUILDING IS NOT FEASIBLE OR VOIDS THE MANUFACTURER' S WARRANTY.

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ELECTRICAL DETAILS

072216

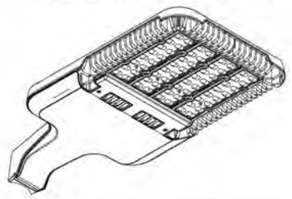
SHEET E 5.1 OF 11

Redefining value with outstanding performance

PHILIPS GARDCO, LED SITE & AREA LUMINAIRE, ECOFORM

The Philips Gardco EcoForm combines economy with performance in an LED area luminaire. Capable of delivering up to 20,000 lumens or more in a compact, low profile LED luminaire, EcoForm offers a new level of customer value. EcoForm features an innovative retrofit arm kit, simplifying site conversions to LED by eliminating the need to drill additional holes in most existing poles. Integral control systems available for further energy savings.

ECOFORM
OUTDOOR SITE & AREA



DESIGNLIGHTS CONSORTIUM

Project:
Location:
Catalog No.:
Fixture Type:
Mfg: Qty:
Notes:

Ordering guide

Prefix		Mounting	Optics	LED Array & LED Wattage	LED Selection	Voltage	Finish	Options
ECF	EcoForm Standard Luminaire	**1** Single	**2** Type 2	530 mA	**CW** 5,700K 70 CRI	**UNV** 120-277V	**BRP** Bronze Paint	**TL** Tool-Less entry & driver removal hardware
ECF-DIM	EcoForm with 0-10V Dimming	**2** 2@180	**3** Type 3	**55LA-3253**[1]	**NW** 4,000K 70 CRI	**HVU** 347-480V	**BLP** Black Paint	**TB**[4] Terminal Block
ECF-APD[1]	EcoForm with Auto Profile Dimming	**2@90** 2@90	**4** Type 4	**75LA-4853**	**WW**[1] 3,000K 70 CRI	**120**	**WP** White Paint	**IS**[5] Internal Shield
ECF-MR50[2]	EcoForm with Motion Response at 50% low. Pole mounted sensor	**3** 3@90	**5** Type 5	**100LA-6453**		**208**	**NP** Natural Paint	**LF**[5,10] Line Fusing
ECF-APD-MRO[2]	EcoForm with Auto Profile Dimming and Motion Response Override. Pole mounted sensor	**3@120** 3@120		700mA **70LA-3270** **105LA-4870** **135LA-6470**		**240**	**OC** Optional Color Specify optional color or RAL ex: OC:LCP or OC:RAL9024	**LFC**[6,10] Line Fusing for Canada
ECF-MRI[2,4]	EcoForm with Motion Response at 50% low. Luminaire mounted sensor	**4** 4@90		1050mA **105LA-321A**[1] **160LA-481A** **215LA-641A**	SEE CHART	**277**		**PCR** Photocell Receptacle Only
ECF-APD-MRI[2,4]	EcoForm with Auto Profile Dimming with Motion Response Override. Luminaire mounted sensor	**WS** Wall mount including Surface conduit. Rise entry permitted.	SEE DRAWINGS			**347**		**PC**[6,7,10] Receptacle with Photocell
		MA (Mast Arm Fitter: (requires 2-3/8" O.D. Mast Arm)				**480**	**SC** Special Color Specify Mug, supply color chip. Requires factory quote	**PCB**[6,7,10] Photocell Button
								RAM Retrofit Arm Mount Kit
								PTF2[9] Pole Top Fitter for 2-3/8"-3" Tenon
								PTF3[9] Pole Top Fitter for 3"-3.5" Tenon
								PTF4[9] Pole Top Fitter for 3.5"-4" Tenon
								RPA[9] Round Pole Adaptor for 3" to 3.5" OD
								BD Bird Deterrant (field installed only)

AS REQUIRED

1. Available in 120V thru 277V only.
2. MR50 and APD-MRO luminaires require one motion sensor per pole, ordered separately. See Accessories on page 2. Available 120V to 277V only.
3. Contact Factory for lead times on warm white.
4. ECF-MRI requires combustible sensor when used with Terminal Block (TB) option.
5. Not available with Type 5 optics.
6. Voltage must be specified.
7. Not available in 480V.
8. Not available in 1@ (2).
9. No adaptor required for 4" round poles. RPAs provided with Black Paint standard.
10. Not available with UNV (120-277V).

PHILIPS GARDCO

Accessories (Order Separately)

FS1R-100 MR hand held programmer (For use with 'MRI' motion response when field programming is required). If desired, only one is needed per job.

MS-A-120V 120V input - Motion Sensor for MR50 or APD-MRO

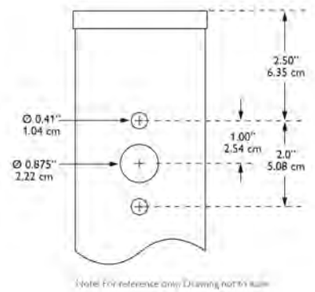
MS-A-277V 277V input - Motion Sensor for MR50 or APD-MRO

LED Wattage and Lumen Values - Standard EcoForm Luminaire

Order Code (standard units)	Array Quantity	Total LEDs	LED Current (mA)	Average System Watts[11]	LED Selection	Initial Lumens[12] 2 Type 2	3 Type 3	4 Type 4	5 Type 5
55LA-3253	2	32	530	52	NW	5,994 (s)	5,895 (s)	5,823 (s)	5,588 (s)
75LA-4853	3	48	530	77	NW	8,899 (s)	8,753 (s)	8,646 (s)	8,297 (s)
100LA-6453	4	64	530	103	NW	11,896 (s)	11,700	11,558	11,091
70LA-3270	2	32	700	69	NW	7,385 (s)	7,576 (s)	7,293 (s)	7,068 (s)
FIXTURE 'A' **105LA-4870**	3	48	700	104	NW	10,965 (s)	11,249 (s)	10,828 (s)	10,494 (s)
135LA-6470	4	64	700	139	NW	14,657 (s)	15,037	14,475 (s)	14,028
105LA-321A	2	32	1050	107	NW	10,199 (s)	10,458	10,072 (s)	9,767
160LA-481A	3	48	1050	158	NW	15,144 (s)	15,565	14,955 (s)	14,465
FIXTURE 'B' **215LA-641A**	4	64	1050	211	NW	20,243	20,252	19,991	19,880

11. System input wattage may vary based on input voltage by up to +/- 10% and based on manufacturer forward voltage by up to +/- 8%.
12. Lumen values based on photometric tests performed in compliance with IESNA LM-79.
(s). Data is scaled based on tests of similar, but not identical, luminaires.

EcoForm Drill Template (Standard Arm Mount)



Note: For reference only. Drawing not to scale.

ARM ACCESSORIES AS REQUIRED

MOUNT FIXTURE 'A' AT 20 FEET AND FIXTURE 'B' AT 25 FEET (FROM TOP OF POLE BASE) ON A SINGLE STEEL POLE IN ACCORDANCE WITH POLE BASE DETAIL.

THE LIGHT FIXTURE WILL BE ABOUT 23 AND 28 FEET RESPECTIVELY ABOVE GRADE.

(NOTE THAT TWO POLES SHALL HAVE RECEPTACLES INSTALLED IN THEM WHICH WILL REQUIRE AN INTEGRAL RECEPTACLE MOUNTING BOX.)

FIXTURE 'A' AND FIXTURE 'B'

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MONTANA STATE PARKS
REAL MONTANA. REAL CLOSE.

MT FISH, WILDLIFE & PARKS
MILLTOWN STATE PARK

ELECTRICAL CATALOG SHEETS

072216

SHEET E 6.0 OF 11

Luminaire Configuration Information

ECF

Philips Gardco EcoForm LED standard luminaire providing constant wattage and constant light output when power to the luminaire is energized.

ECF-DIM

Philips Gardco EcoForm LED luminaire provided with 0-10V dimming for connection to a control system provided by others.

ECF-APD

Philips Gardco EcoForm LED luminaire with Automatic Profile Dimming. Luminaire is provided with a Philips DynaDimmer module, programmed to go to 50% power, 50% light output two (2) hours prior to night time mid-point and remain at 50% for six (6) hours after night time mid-point. Mid-point is continuously recalculated by the Philips DynaDimmer module based on the average mid-point of the last two full night cycles. Short duration cycles, and power interruptions are ignored and do not affect the determination of mid-point.

ECF-APD is available in 120V through 277V input only.

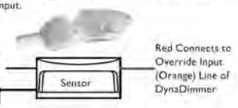
ECF-APD Dimming Profile:

ECF-MR50

Philips Gardco EcoForm LED luminaire with motion response, providing a 50% power reduction on low and a commensurate reduction in light output. The power and light output reduction is accomplished utilizing the Philips DynaDimmer module, programmed for a constant 50% power. Power supplied by the motion sensor connected to the override line on the DynaDimmer takes the luminaire to high setting, 100% power and light output, when motion is detected. The luminaire remains on high until no motion is detected for the motion sensor duration period, after which the luminaire returns to low. Duration period is factory set at 15 minutes, and is field adjustable from 5 minutes up to 15 minutes.

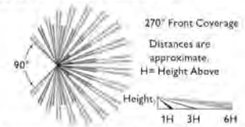
ECF-MR50 is available in 120V through 277V input only to the luminaire.
Motion sensors require single voltage 120V or 277V input.

The Area PIR motion sensor is the WattStopper EW-200-120-W (120V Input - MSA-120V) or the WattStopper EW-200-277-W (277V Input - MSA-277V.) One motion sensor per pole is required and is ordered separately. Area sensors require single voltage 120V or 277V input.



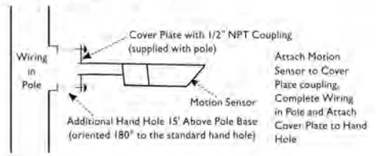
The area motion detector provides coverage equal to up to 6 times the sensor height above ground, 270° from the front-center of the sensor.

Area PIR Motion Sensor Coverage Pattern:



Motion response requires that the pole include an additional hand hole 15 feet above the pole base, normally oriented 180° to the standard hand hole. For Philips Gardco poles, order the pole with the Motion Sensor Mounting (MSM) option which includes the hand hole and a special hand hole cover plate for the sensor with a 1/2" NPT receptacle centered on the hand hole cover plate into which the motion sensor mounts. Once the motion sensor is connected to the hand hole cover plate, then wiring connections are completed in the pole. The plate (complete with motion sensor attached and wired) is then mounted to the hand hole. If poles are supplied by others, the customer is responsible for providing suitable mounting accommodations for the motion sensor in the pole.

Mounting to a Philips Gardco Pole



ECF-APD-MRO

Philips Gardco EcoForm LED luminaire with Automatic Profile Dimming, with Motion Response Override. The ECF-APD-MRO combines the benefits of both automatic profile dimming and motion response, using the Philips DynaDimmer module. The luminaire will dim to 50% power, 50% light output, per the dimming profile shown for the ECF-APD. If motion is detected during the time that the luminaire is operating at 50%, the luminaire returns to 100% power and light output. The luminaire remains on high until no motion is detected for the duration period, after which the luminaire returns to low. Duration period is factory set at 15 minutes, and is field adjustable from 5 minutes up to 15 minutes.

NOTES:
ECF-APD-MRO is available in 120V through 277V input only to luminaire. The motion sensor requires either 120V or 277V input to the motion sensor.

The ECF-APD-MRO has the same pole requirements and utilizes the same motion sensors as the ECF-MR50. The motion sensor mounts and wires identically as well. The ECF-APD-MRO utilizes the identical dimming profile as shown for the ECF-APD.

By combining the benefits of automatic profile dimming and motion response, the ECF-APD-MRO assures maximum energy savings, and insures that adequate light is present if motion is detected.

All motion sensors utilized consume 0.0 watts in the off state.

Luminaire Configuration Information (Continued)

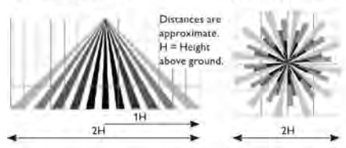
ECF-MRI

Luminaires with Motion Response include a LED driver and an integral programmable motion sensor. The motion sensor is set to a constant 50%. When motion is detected, the luminaire goes to 100%. The luminaire remains on high until no motion is detected for the motion sensor duration period, after which the luminaire returns to low. Duration period is factory set at 5 minutes. Available with 120V or 277V only.

Luminaires include a passive infrared (PIR) motion sensor, WattStopper® FSP-211 equipped with an FSP-L3 lens, capable of detecting motion within 20 feet of the sensor, 180° around the luminaire, when placed at a 20 foot mounting height, or mounted on a wall. Available in 120V or 277V input only. Motion sensor off state power is 0.0 watts.

The approximate motion sensor coverage pattern is as shown below.

Side Coverage Pattern **Top Coverage Pattern**



ECF-APD- MRI

Luminaires with Automatic Profile Dimming and Motion Response Override combine the benefits of both automatic profile dimming and motion response. APD-MRI luminaires utilize Philips DynaDimmer. The luminaire will dim to 50% power, 50% light output, per the dimming profile shown for APD luminaires (see page 4). If motion is detected during the time that the luminaire is operating at 50%, the luminaire goes to 100% power and light output. The luminaire remains on high until no motion is detected for the duration period, after which the luminaire returns to low. Duration period is factory set at 5 minutes.

APD-MRI luminaires are available with 120V or 277V input voltages only.

APD-MRI luminaires use the identical motion sensor as MRI luminaires. See motion sensor details for ECF-MRI.

FS1R-100 Wireless Remote Programming Tool

The FS1R-100 Remote Programming Tool accessory permits adjustment of ECF-MRI and ECF-APD-MRI sensor settings, including duration and dimming level on low, without the need to connect any wires to the luminaire.

The FS1R-100 Wireless IR Programming Tool is a handheld tool for setup and testing of WattStopper FSP-211. It provides wireless access to the FSP-211 sensors for setup and parameter changes.

The FS1R-100 display shows menus and prompts to lead you through each process. The navigation pad provides a familiar way to navigate through the customization fields.

Within a certain mounting height of the sensor, the FS1R-100 allows modification of the system without requiring ladders or tools simply with a touch of a few buttons.

The FS1R-100 IR transceiver allows bi-directional communication between the FSP-211 and the FS1R-100 programming tool . Simple menu screens let you see the current status of the system and make changes. It can change FSP-211 sensor parameters such as high/low mode, sensitivity, time delay, cut off and more. With the FS1R-100 you can also establish and store FSP-211 parameter profiles.

The FS1R-100 operates on three standard 1.5V AAA Alkaline batteries or three rechargeable AAA NiMH batteries. The battery status displays in the upper right corner of the display. Three bars next to BAT= indicates a full battery charge. A warning appears on the display when the battery level falls below a minimum acceptable level. To conserve battery power, the FS1R-100 automatically shuts off 10 minutes after the last key press.

You navigate from one field to another using (up) or (down) arrow keys. The active field is indicated by flashing (alternates between yellow text on black background and black text on yellow background.)

Once active, use the Select button to move to a menu or function within the active field. Value fields are used to adjust parameter settings. They are shown in "less-than/greater-than" symbols: <value>. Once active, change them using (left) and (right) arrow keys. In general the up key increments and the down key decrements a value. Selections wrap-around if you continue to press the key beyond maximum or minimum values. Moving away from the value field overwrites the original value. The Home button takes you to the main menu. The Back button can be thought of as an undo function. It takes you back one screen. Changes that were in process prior to pressing the key are lost.More information on the FS1R-100 Remote Programming Tool is available at wattstopper.com.

Specifications

General Description

The Philips Gardco EcoForm combines economy with performance in an LED area luminaire. Capable of delivering up to 20,000 lumens or more in a compact, low profile LED luminaire, EcoForm offers a new level of customer value. Integral control systems including motion response are available for further energy savings during off peak hours. EcoForm is also part of the Philips Solar Solution. See Solar Specification Sheet for details.

Housing

One piece die cast aluminum housing with integral arm and separate,self retained hinged, one piece die cast door frame.

IP Rating

LED light engine rated IP66.

Vibration Resistance

EcoForm with Standard Arm carries a 3G vibration rating that conforms to standards set forth by ANSI C136.31. Testing includes vibration to 3G acceleration in three axes, all performed on the same luminaire.

Electrical

Driver efficiency (>90% standard). 120-480V available (restrictions apply). Open/short circuit protection. Optional 0-10V dimming to 10% power. RoHS compliant. Surge protector standard, 10KA per ANSI/ IEEE C62.41.2.

LED Board and Array

32, 48, or 64 LEDs. Color temperatures: 3000K, 4000K, 5700K +/- 250K. Minimum CRI of 70. Aluminum metal clad board. RoHS compliant.

Energy Saving Benefits

System efficacy up to 95 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

Motion Sensors

ECF-MR50, ECF-APD-MRO, ECF-MRI, ECF-APD-MRI luminaires may be specified for additional energy savings during unoccupied periods. See pages 4-6 for complete details.

LED Thermal Management

The housing design allows the one piece housing to provide excellent thermal management critical to long LED system life.

Optical Systems

Type 2, 3, 4, and 5 distributions available. Internal Shield option mounts to LED optics and is available with Type 2, 3, and 4 distributions to control backlight.

Mounting

Standard luminaire arm mounts to 4" round poles. Square pole adapter included with every luminaire. Round Pole Adapter (RPA) required for 3-3.9" poles.

Retrofit Arm Mount

EcoForm features an innovative retrofit arm kit. When specified with the retrofit arm (RAM) option, EcoForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately.

Listings

ETL/cETL listed to the UL 1598 standard, suitable for Wet Locations. Suitable for use in ambients from -30° to 40°C (-22° to 104°F). The quality systems of this facility have been registered by UL to the ISO 9001 series standards. All EcoForm luminaires equipped with NW and CW are DesignLights Consortium® qualified.

Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. Standard colors include bronze (BRP), black (BLP), white (WP), and natural aluminum (NP). Consult factory for specs on optional or custom colors.

Warranty

EcoForm luminaires feature a 5 year limited warranty. Philips Gardco LED luminaires with LED arrays feature a 5 year limited warranty covering the LED arrays. LED Drivers also carry a 5 year limited warranty. Motion sensors are covered by warranty for 5 years by the motion sensor manufacturer.

LED Performance:

PREDICTED LUMEN DEPRECIATION DATA[1]

Ambient Temperature °C	Driver mA	Calculated L_{70} Hours[13,14]	L_{70} Per TM-21[14,15]	Lumen Maintenance % @ 60,000 hours
Up to 40 °C	Up to 1050 mA	> 350,000 Hours	> 60,000 Hours	97%

1) Predicted performance derived from LED manufacturer values and engineering (design) estimates, based on IESNA LM-80 methodology. Actual performance may vary due to field application conditions.
14) L_{70} is the predicted time when LED performance depreciates to 70% of initial lumen output.
15) Calculated per IESNA TM-21-11. Published L_{70} hours limited to 6 times actual LED test hours.

Philips Lighting Company
200 Franklin Square Drive
Somerset, NJ 08873
Phone: 855-486-2216

Philips Lighting Company
281 Hillmount Road
Markham ON, Canada L6C 2S3
Phone: 800-668-9008

FIXTURE 'A' AND FIXTURE 'B'

FUSSELL ENGINEERING
CONSULTING AND DESIGN
2435 DIXON STREET MISSOULA, MT 59801
(406) 721-6996 fus@aol.com

BY	DATE	REVISION DESCRIPTION

DESIGN MTF PROJ. NO 5943
DRAWN MTF DATE 05/2016
CHECKED MTF SURVEYED DJ&A

DJ&A, P.C.
CONSULTING ENGINEERS & LAND SURVEYORS
3203 Russell Street, Missoula, Montana 59801-8591
Phone 406/721-4320 Fax 406/549-6371

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ELECTRICAL CATALOG SHEETS

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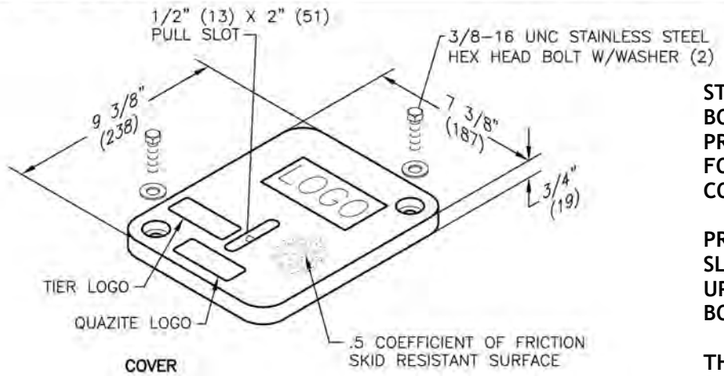
SHEET E 6.1 OF 11

Quazite®

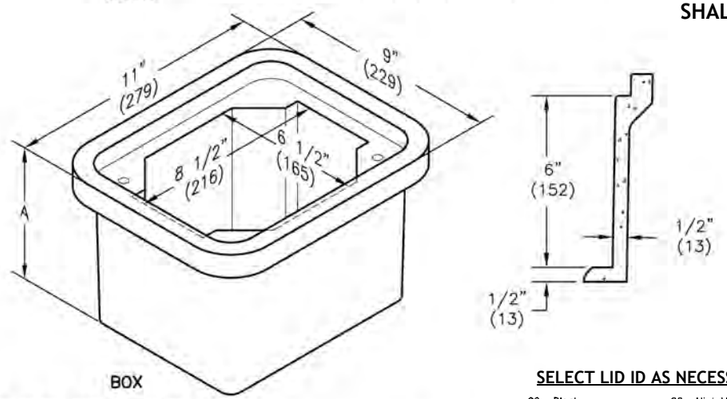
SPECIFICATIONS/DATA

6X8 SIZE SHOWN
ADJUST SIZE AS REQUIRED

6" x 8" PC Style (Stackable) Assembly



COVER



BOX

STACK AND SIZE JUNCTION BOXES AS REQUIRED TO PROVIDE ADEQUATE SPACE FOR BRANCH CIRCUIT URD COIL OR SPLICES.

PROVIDE SCHEDULE 40 SLEEVES AND SWEEP ELBOWS UP FROM BURIAL DEPTH INTO BOTTOM OF JUNCTION BOX.

THE JUNCTION BOX LID SHALL BE FLUSH WITH GRADE.

Covers (Blank unless logo is specified)

	DESCRIPTION	PART NO.	WEIGHT #	DESIGN/TEST LOAD #	ANSI TIER*
UL	W/2 Bolts	PC0608HA00	4 (1.8 kg)	15,000 / 22,500	15
UL	Gasketed w/4 Bolts	PC0608HG00	4 (1.8 kg)	15,000 / 22,500	15

* Gasketed covers and bolt grommets must be used with a gasketed box. Gaskets reduce the inflow of fluids but do not make the enclosure water tight.

SELECT LID ID AS NECESSARY

09	Blank	26	High Voltage
10	C.A.T.V.	10	Irrigation
12	Communications	29	Lighting
14	Controls	32	Non-potable water
17	Electric	41	Street Lighting
21	Fiber Optics	43	Telephone
23	Gas	44	Traffic
24	Ground	46	Traffic Signal
		50	Water

Boxes (Stackable with self-aligning, replaceable EZ-Nut)

	DESCRIPTION	PART NO.	WEIGHT #	DIMENSION A	DESIGN/TEST LOAD #	ANSI TIER*
UL	Open Bottom	PC0608BA06	14 (6.4 kg)	6 3/4" (171 mm)	15,000 / 22,500	15
UL	Open Bottom w/Gasket	PC0608BG06	14 (6.4 kg)	6 3/4" (171 mm)	15,000 / 22,500	15
UL	Solid Bottom	PC0608DA06	15 (6.8 kg)	7 1/4" (184 mm)	15,000 / 22,500	15
UL	Solid Bottom w/Gasket	PC0608DG06	15 (6.8 kg)	7 1/4" (184 mm)	15,000 / 22,500	15

Dimensions & weights in parentheses are metric equivalent.
* Loadings comply with ANSI/SCTE 77 (see page 9).

JANUARY 2011

HUBBELL

IN-THE-GROUND JUNCTION BOX

PowerMark Gold Meter Socket Load Centers
With Bonded Neutrals

PowerMark Gold Load Centers Single-Phase, Three-Wire, 120/240 Vac, Ring Type Narrow — GO-137B

Main Ampere Rating	1 Pole, 1" Spaces	2 Pole, 1" Spaces	1 Pole, 1/2" Spaces	2 Pole, 1/2" Spaces	Total 1-pole Spaces	Enclosure Type	Front Type	Bypass Type	UL Incoming	Agency Certification	Product Number	List Price
100	16	8	32	14	32	Outdoor (NEMA 3R)	Semi-Flush	None	OH/UG	UL EUSERC	TSM1610CFCU[1]	$491.00
125	12	6	24	12	24	Outdoor (NEMA 3R)	Semi-Flush	None	OH/UG	UL EUSERC	TSM1212CFCU[1]	$892.00
125	16	8	32	14	32	Outdoor (NEMA 3R)	Semi-Flush	None	OH/UG	UL EUSERC	TSM1612CFCU[1]	$1054.00
200	20	10	40	18	40	Outdoor (NEMA 3R)	Semi-Flush	None	OH/UG	UL EUSERC	TSM2020CFCU[1]	$1261.00
200	20	10	40	18	40	Outdoor (NEMA 3R)	Semi-Flush	None	UG	UL	TSM2020UFCU[1]	$1261.00
100	16	8	32	14	32	Outdoor (NEMA 3R)	Surface	None	OH/UG	UL EUSERC	TSM1610CSCU[1,2,3]	$491.00
125	12	6	24	12	24	Outdoor (NEMA 3R)	Surface	None	OH/UG	UL EUSERC	TSM1212CSCU[1,2,3]	$892.00
125	16	8	32	14	32	Outdoor (NEMA 3R)	Surface	None	OH/UG	UL EUSERC	TSM1612CSCU[1,2,3]	$1054.00
200	20	10	40	18	40	Outdoor (NEMA 3R)	Surface	None	OH/UG	UL EUSERC	TSM2020CSCU[1,2,3]	$1261.00

[1]Accepts field installed fifth jaw terminal in the 3 or 9 o'clock position. Product number TJAW53; order separately.
[2]Devices include removable closing cap. Order hub separately. See page 1-27.
[3]Surface mounted units have two hub provisions on top and wall.

Ring Type Narrow

Product Number	Box Number	Unit Width (in inches)	Unit Height (in inches)	Depth (in inches)	Factory Inst. Svcs Disc	Field Inst. Svcs Disc	Main Wire Size (AWG/kcmil) Cu-Al	Equipment Ground Kit
TSM1610CFCU	R19	16-3/4	28-1/2	7-5/16	THHQL		12-2/0	TGK12 (order separately)
TSM1212CFCU	R19	16-3/4	28-1/2	7-5/16	THHQL		12-2/0	TGK12 (order separately)
TSM1612CFCU	R19	16-3/4	28-1/2	7-5/16	THHQL		12-2/0	TGK12 (order separately)
TSM2020CFCU	R17	16-3/4	34-1/4	7-5/16	THQMV		1-300	TGK12 (order separately)
TSM2020UFCU	R17	16-3/4	34-1/4	7-5/16	THQMV		1-4/0	TGK12 (order separately)
TSM1610CSCU	R20	14-3/4	27-5/16	5-7/16	THHQL		12-2/0	TGK12 (order separately)
TSM1212CSCU	R20	14-3/4	27-5/16	5-7/16	THHQL		12-2/0	TGK12 (order separately)
TSM1612CSCU	R20	14-3/4	27-5/16	5-7/16	THHQL		12-2/0	TGK12 (order separately)
TSM2020CSCU	R18	14-3/4	33	6-5/16	THQMV		1-300	TGK12 (order separately)

PowerMark Gold Load Centers Single-Phase, Three-Wire 120/240 Vac, Ring Type Wide — GO-137B

Main Ampere Rating	1 Pole, 1" Spaces	2 Pole, 1" Spaces	1 Pole, 1/2" Spaces	2 Pole, 1/2" Spaces	Total 1-pole Spaces	Enclosure Type	Front Type	Bypass Type	UL Incoming	Agency Certification	Product Number	List Price
200	32	16	16	6	40	Outdoor (NEMA 3R)	Surface Front	None	UG	UL EUSERC	TSM3220UWCU[2]	$1261.00
200	40	20	0	0	40	Outdoor (NEMA 3R)	Surface Front	None	UG	UL EUSERC	TSM4020UWCU[2]	$1511.00

[2]Devices include removable closing cap. Order hub separately. See page 1-27.

Ring Type Wide

Product Number	Box Number	Unit Width (in inches)	Unit Height (in inches)	Depth (in inches)	Factory Inst. Svcs Disc	Field Inst. Svcs Disc	Main Wire Size (AWG/kcmil) Cu-Al	Equipment Ground Kit
TSM3220UWCU	R28	22-1/2	27-7/8	6-1/4	THQMV		1-300	TGK12 (order separately)
TSM4020UWCU	R29	22-1/2	34-7/8	6-1/4	THQMV		1-300	TGK12 (order separately)

PowerMark Gold Load Centers Single-Phase, Three-Wire, 120/240 Vac, Ring Type Over/Under — GO-137B

Main Ampere Rating	1 Pole, 1" Spaces	2 Pole, 1" Spaces	1 Pole, 1/2" Spaces	2 Pole, 1/2" Spaces	Total 1-pole Spaces	Enclosure Type	Front Type	Bypass Type	UL Incoming	Agency Certification	Product Number	List Price
200	32	14	16	6	40	Outdoor (NEMA 3R)	Semi-Flush	None	UG	UL EUSERC	TSM3220UFCU	$1390.00
225	20	10	40	18	40	Outdoor (NEMA 3R)	Semi-Flush	None	UG	UL EUSERC	TSM2022UFCU	$1350.00
225	32	14	16	6	40	Outdoor (NEMA 3R)	Semi-Flush	None	UG	UL EUSERC	TSM3222UFCU	$1410.00
200	32	14	16	6	40	Outdoor (NEMA 3R)	Surface	None	UG	UL EUSERC	TSM3220USCU[1]	$1390.00
225	20	10	40	18	40	Outdoor (NEMA 3R)	Surface	None	UG	UL EUSERC	TSM2022USCU[1]	$1350.00
225	32	14	16	6	40	Outdoor (NEMA 3R)	Surface	None	UG	UL EUSERC	TSM3222USCU[1]	$1410.00

[1]Devices include removable closing cap. Order hub separately. See page 1-27.

NOTES
1. VERIFY METER SOCKET COMPATIBILITY WITH NWE.
2. INSTALL METER LOAD CENTER COMBINATION ON STRUCTURE. SEE DETAIL SHEETS.

PANEL 'A'

FOR #2 URD CIRCUITS BEING SUPPLIED BY 2 POLE 30 AMP BREAKERS, BRING THE URD UP INTO A JUNCTION BOX MOUNTED ON THE OUTSIDE OF THE LOAD CENTER AND THEN TRANSITION TO #10 CU THWN CONDUCTORS FOR BREAKER CONNECTION.

USE HEAT SHRINK INSULATED COMPRESSION SPLICES TO MAKE THE CONNECTION.

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(406) 721-6996 fus@aol.com

BY	DATE	REVISION DESCRIPTION

DESIGN MTF PROJ. NO 5943
DRAWN MTF DATE 05/2016
CHECKED MTF SURVEYED DJ&A

DJ&A, P.C.
CONSULTING ENGINEERS & LAND SURVEYORS
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ELECTRICAL CATALOG SHEETS

072216

SHEET E 6.2 OF 11

Weatherproof Receptacle Covers with Patented Insert Design

These NEMA 3R receptacle covers ensure compliance with 2002 NEC Article 406.8 (B) (1) which requires that 15 and 20 ampere, 125 and 250 volt receptacles installed outdoors in a wet location have an enclosure that is weatherproof whether or not the attachment plug cap is inserted. They also meet the 1999 NEC Article 410-57(b) and are designed to meet the 1999 NEC Article 210-60(b), which requires that receptacles installed behind beds in hotels and motels be protected with a suitable guard.

All covers are shipped with gasket, mounting screws, base and cover assembly and patented inserts. The Flexi-Guard series provides inserts for a variety of applications; 16 for the WP1100 single gang series and 70 for the WP1200 two gang series. The single gang Flexi-Guard models are all designed to mount horizontally or vertically. The patented insert design ensures flexibility in the field by simply inserting the proper insert into the base and cover assembly. The two gang Flexi-Guard models utilize six "split" inserts which create virtually any dual device combination, as well as providing additional flexibility because the inserts can be rotated 90, 180 or 270 degrees. This provides coverage for horizontally or vertically mounted devices as well as "left hand" or "right hand" applications without removing and switching the two installed devices.

Models WP1100C, WP1100WC, WP1000C, WP1000GC, WP1000HC, WP1000HGC, WP1020C and WP1020GC are recommended for 16 gauge or lighter cord sets. Models WP1110C, WP1110WC, WP1010C, WP1010HC, WP1030C and WP1030GC are recommended for 14 gauge or lighter cord sets. The "jumbo covers" WP1150C, WP1250C, WP1050 and WP1050G provide protection for a single large cord set (up to 3/4" dia.) for portable spa heaters and other heavy duty applications. A lockable hasp is provided on selected models. The hasp accepts up to .315" (8 mm) diameter shank.

NEMA 3R

Meets UL and CSA Cold Impact Testing at -60˚F (-51˚C)
Patented: U.S. Patent #5 280 135 U.S. Design Pat. #342233
Canadian Patent #2 073 932 Other Patents Pending

Waterproof Cover Applications

- Vending Machines
- RV Connectors
- Sprinkling Controls
- Car Lot Lighting
- Car Washes
- Food Preparation
- Hotel Applications
- Amusement Equipment
- Seasonal Lighting
- Drinking Fountains
- Gate Controls
- Low Voltage Lighting
- Plant Grow Lighting
- Scoreboard Controls
- Ventilating Fans
- Remote Power Needs
- Athletic Field Lighting
- Process Start Up
- Meat Processing
- Plant Watering
- Landscape Lighting
- Portable Spas
- Score Board Controls
- Equipment
- Engine Block Heaters
- Remote Feeders
- Outdoor Signs
- Portable Marquee
- Bug Zappers
- Septic Lift Pumps
- Holiday Lighting
- Irrigation Pumps

Specifications

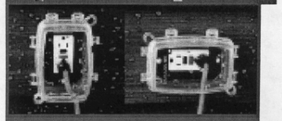
All covers for flushmount, surface mount or FS junction box mounting.

Cover – Clear (gray or white on selected models) UV stabilized polycarbonate with two cord outlets 1/2" (12.7 mm) Wide by 9/16" (14.2 mm) High. Models WP1150C, WP1250C and WP1050 one cord outlet 3/4" (19.1 mm) Wide by 1-5/16" (33.3 mm) High.

Mounting Base and Inserts – Black UV stabilized polycarbonate.

Gasket – Neoprene - 1/8" (4.8 mm) thick with slits for mounting screws.

Shipping Weight – WP1100C / WP1000 / WP1000H – .38 lbs. (0.17 kg)
WP1110C / WP1010 / WP1010H – .41 lbs. (0.19 kg)
WP1150C / WP1230C / WP1030 – .75 lbs. (0.34 kg)
WP1220C / WP1020 – .72 lbs. (0.33 kg)
WP1250C / WP1050 – .9 lbs. (0.41 kg)



MEETS 2002 NEC 406.8(B) (1) Receptacles installed outdoors in a wet location must have an enclosure that is weatherproof when you insert the attachment plug.

UL5140 E142193 C22.2-42.1 LR88576

Die Cast Weatherproof Receptacle Covers

These heavy duty die cast receptacle covers ensure compliance with the National Electric Code (NEC). These models offer the same features as the plastic models but are manufactured of heavy duty cast metal for severe applications such as schools and commercial buildings. The two gang model WP1030MC includes inserts for double gang duplex and GFCI requirements. This patented insert design uses the same inserts as all WP1000 series weatherproof covers and provides flexibility in the field by selecting and inserting the proper insert. For other applications see insert listing below.

All models are recommended for 14 gauge or lighter cord sets. A lockable hasp is provided (lock not included). The hasp accepts up to .315" (8 mm) diameter shank.

Specifications

Cover – Gray die cast metal

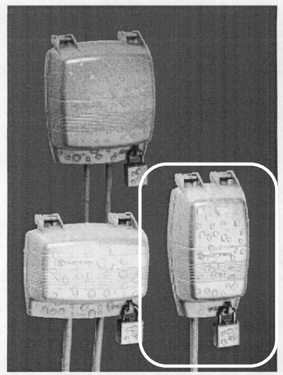
Mounting Base – Gray die cast metal with cord outlets 1" (25.4 mm) Wide by 5/8" (15.9 mm) High; one for models WP1010MC and WP1010HMC and two for model WP1030MC.

Inserts – Black UV stabilized polycarbonate.

Gasket – Neoprene 1/8" (3.2 cm) thick with slits for mounting screws.

Shipping Weight – WP1010MC – 0.8 lbs. (0.36 kg)
WP1010HMC – 0.9 lbs. (0.41 kg)
WP1030MC – 1.1 lbs. (0.5 kg)

All models comply with 2002 NEC Article 250.146 which provides direct mounting of wiring devices to the switch box.

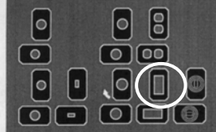


WEATHER PROOF RECEPTACLE COVER

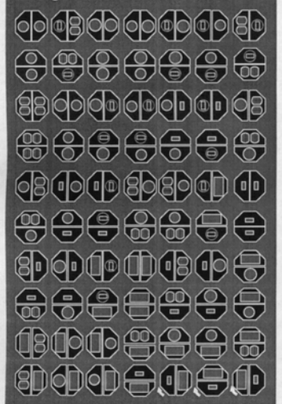
Inserts

Inserts fit single gang models and two gang models of clear, gray or die cast design. The 2-gang inserts for models WP1020, WP1030, WP1020GC, WP1030GC, WP1030MC and WP1050 can be mounted at any angle 90, 180 or 270 degrees from that shown. Additional hardware, if required, and special 2-gang gasket is packaged with 2-gang (WP200 series) inserts.

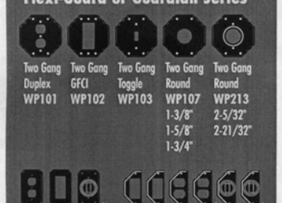
16 Configurations for Single Gang WP1100C Series



70 Configurations for Double Gang WP1200C Series



Additional inserts available for Flexi-Guard or Guardian Series



Single Gang Flexi-Guard WP17
† Converts to toggle, 1-3/8", 1-5/8", 1-3/4" or 2-1/8" diameter round

Two Gang Flexi-Guard WP217
† Converts to toggle, 1-3/8" or 1-5/8" diameter round

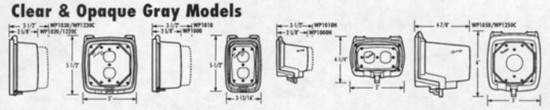
Now you can handle even more with less.

New Intermatic Flexi-Guard Weatherproof Receptacle Covers let you handle even more configurations with fewer units. The unique patented inserts and covers allow you to keep even less inventory than before, and cover more jobs out in the field.

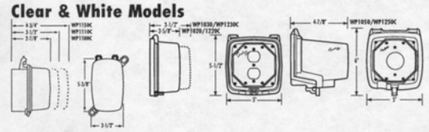
Our single gang models handle both vertical or horizontal applications, just by changing the hinge points. Our two-gang models include snap-together, rotating inserts that create combinations for almost every application.

With these new Flexi-Guard models, now more than ever, Intermatic is your the best NEC code solution under the sun.

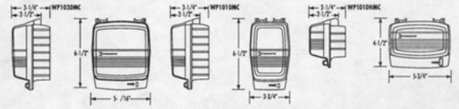
Clear & Opaque Gray Models



Clear & White Models



Heavy Duty Die Cast Models



	Patented Single Gang Vertical or Horizontal		Two Gang w/Patented Inserts	Patented Die-Cast Metal	Patented Two-Gang Fixed		Patented Single Gang Fixed	
2-1/4" Standard Depth	Clear* WP1100C Vertical or Horizontal	White* WP1100WC	Clear WP1220C②		Clear WP1020C②	Gray WP1020GC②	Clear WP1000C ▮ WP1000HC ◗*	Gray WP1000GC ▮ WP1000HGC ◗*
3-1/8" Standard Depth	Clear* WP1110C Vertical or Horizontal	White* WP1110WC	Clear WP1230C②	Gray* WP1010MC ▮ WP1010HMC ◗ WP1030MC ②	Clear WP1030C②	Gray WP1030GC②	Clear WP1010C ▮ WP1010HC ◗*	Gray WP1010GC ▮ WP1010HGC ◗*
4-3/4" Jumbo Depth	Clear* WP1150C Vertical or Horizontal		Clear* WP1250C②		Clear* WP1050②	Gray* WP1050G②		

* With lockable hasp Horizontal ◗ Vertical ▮ Two Gang ②

WP1100 Series	WP1200 Series	WP1000MC Series	WP1000 Series	WP1000 Series
Includes 3 Patented Inserts	Includes 6 Snap-Together Patented Inserts	Includes these inserts	Includes these inserts	Includes these inserts
† Converts to toggle, 1-3/8", 1-5/8", 1-3/4" or 2-1/8" diameter round	† Converts to toggle, 1-3/8" or 1-5/8" diameter round	Single Gang		

WEATHER PROOF RECEPTACLE INSERT

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BY	DATE	REVISION DESCRIPTION

DESIGN MTF PROJ. NO 5943
DRAWN MTF DATE 05/2016
CHECKED MTF SURVEYED DJ&A

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MONTANA STATE PARKS

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ELECTRICAL CATALOG SHEETS
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